

Connections

Volume 1

Issue 1



From the President

Nearly a Century of Soldering Expertise

Dear Friends and Customers:

It may seem difficult to believe, but Vitronics Soltec has been showing the world how to make better solder connections for nearly 100 years. That's a lot of experience and process know-how, and we're adding to that body of knowledge every day.

We continue to innovate and improve not only the process but the equipment supporting wave, reflow, and selective processes. In this newsletter, for example, you'll read about our new AUTOset™ feature for our XPM reflow systems - a sophisticated program that develops thermal profiles automatically, saving an enormous amount of time for manufacturing engineers. It's a development that every engineer dealing with a high-mix product environment can benefit from.

That's why I'm pleased to introduce our new newsletter, Connections. It's not just about making soldering connections, but about connecting with you - our friends, customers, and members of the Vitronics Soltec family around the world. For years we've been telling folks to 'Make the Right Connection' with Vitronics Soltec, and they have - building the largest soldering systems customer base in the world. I hope you'll continue along the journey with us, and of course I welcome your feedback and comments; let us know how we can serve you better.

Sincerely,

Aaron Saxton, President



Ursula Marquez de Tino Awarded Ph.D.

Ursula Marquez de Tino, Ph.D., Senior Process and Research Engineer, has recently been awarded a Ph. D. degree in Industrial and Systems Engineering from the State University of New York at Binghamton. Ursula works at the Universal Instruments Surface Mount Technology Lab in Binghamton, NY, and is a well-known soldering issues columnist and author in industry trade publications.

Ursula holds a bachelor degree in Industrial Engineering from the Universidad de Lima in Peru. The title of her doctoral dissertation was "Reduction of Nitrogen Consumption of Lead-Free Reflow Processes and Prediction Models for Behaviors of Lead-Free Assemblies".

Ursula provides electronic manufacturing process solutions to Vitronics Soltec customers. She is experienced in performing destructive and non-destructive failure analysis techniques for the purpose of providing corrective recommendations for potential yield problems. She also develops programs in the soldering arena and has developed leading technical papers and presentations for seminars, publications, and educational training programs.



More Inside...

- **AUTOset: Reflow Profiles Automatically**
- **New Distributors in UK, Ireland**
- **Tech Tips for Wave Process Settings**
- **See us at SMTAI in San Diego**

Vitronics Soltec Inks Distribution Agreement with APP and IPT in UK, Ireland



Vitronics Soltec has entered into a new partnership agreement with Anglo Production Processes Ltd. (APP) and IPT Ltd. to represent and distribute Vitronics Soltec soldering machines throughout the UK and Ireland. The agreement became effective in June 2009.

systems are well known for their leading edge technology and reliability. Our goal is to only represent high quality companies and Vitronics Soltec certainly fits into this category”.

In the UK and Irish markets it is a major advantage for APP and IPT to be able to offer the entire soldering range from Wave to Selective from one quality vendor such as Vitronics Soltec. The easy access to the Vitronics Soltec European headquarters in the Netherlands makes it very convenient for customers to perform trials and do application development work. APP and IPT will be responsible for sales, service and spare parts for Vitronics Soltec products, serviced from facilities in Bromsgrove UK, and Cork Ireland.

In making the announcement, Frank van Erp, European Sales Director for Vitronics Soltec said, “This is an import step to secure our support level and presence in this area. APP offers a range of first-class products to the market and has a focus on process-driven applications. To Vitronics Soltec, this is a perfect match with our product line and the way we like to approach the business. Vitronics Soltec historically has been a technology-driven company and to have a partner with such complementary skills provides a solid foundation for a strong future.”

Noel O’Hanlon, Managing Director of APP in the UK and IPT in Ireland, added, “We are delighted to work with such a high quality organization as Vitronics Soltec whose range of Wave, Reflow and Selective Soldering

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At the Shows

In addition to exhibiting at SMTAI, October 4 - 8, 2009 in San Diego (Booth #403), Vitronics Soltec engineers will also present three (3) papers:

“Characterizing Alternative Alloys for SMT Assembly”, by Denis Barbini, Ph.D., and Ursula Marquez de Tino, Ph.D., Vitronics Soltec; Brian Roggeman, UNOVIS Solutions (MFX2, Tuesday, October 6, 1:30pm – 3:00pm); And on Wednesday, Oct. 7., “Optimizing the Selective Soldering process” (SMT5, 10:00am – 11:30am) by Denis Barbini, Ph.D., and Ursula Marquez de Tino, Ph.D., Vitronics Soltec, and “Developing the Optimum Reflow Process: a Matter of Cost and Quality” (SMT6, 1:30pm – 3:00pm) by Denis Barbini, Ph.D., Ursula Marquez de Tino, Ph.D., and Jon Silin, Vitronics Soltec.

In Asia: See Us At Nepcon South China / EMT South China 2009, in Hall 1, Shenzhen Convention & Exhibition Centre, China, 26-28 August 2009. You’ll see one of our XPM Series reflow systems on display in the booth of our distributor, WKK, in Booth No. 1G15.



Product Spotlight

AUTOset™ Creates Accurate Reflow Profiles Fast, Automatically

Developing reflow profiles for new product runs can eat up production time, especially with complex assemblies. In a high product mix environment, too much process development time can eat into productivity. A new feature developed by Vitronics Soltec, AUTOset™, takes advantage of years of process knowledge developed in reflow profiling by Vitronics Soltec. AUTOset makes it possible for the manufacturing engineer to accelerate process development by generating a preliminary reflow profile based on a PCB assembly's physical characteristics. The engineer can then 'fine tune' an optimized profile from the preliminary recipe if needed. However, nearly 100% of the time the engineer doesn't need to modify the auto-created profile at all.

AUTOset effectively controls the six major elements in a reflow thermal profile: Ramp-up heating rate, Thermal soak, i.e., the time and temperature required to level temperature across the board before reflow, Time above liquidus (TAL), or the range of time that the PCB is held at a temperature above the solder melting point, Peak temperature, Cooling rate, and Total heating time.

AUTOset effectively shortens the process development learning curve, can be used by all system operators and is not individual-dependent. It reduces the time usually needed to develop profiles by minimizing the conventional pitfalls of the "first guess" at process set points. AUTOset also provides a consistent approach and results to profile development within a manufacturing facility, leading to higher yields and repeatability throughout.

AUTOset is installed in all new Vitronics Soltec XPM Series reflow soldering machines. It eliminates the need for the operator to "guess" an initial oven recipe, by using an algorithm to calculate the ideal oven recipe based on input data.

The engineer inputs information about the PCB to be processed – physical dimensions, solder type, etc., which allows AUTOset to identify a suitable oven recipe prior to running a single profile. AUTOset saves process development time with a nearly 100% first time success rate. It also saves energy and operating costs by generating more efficient profiles from Vitronics Soltec's vast informational database and nearly 20 years of developing optimized thermal profiles for reflow ovens. AUTOset will work with any third-party thermal profiler.



AUTOset

Upgrades & Improvements

AUTOset is also an upgradable feature that may be available for, or retrofittable to, your reflow system. Want to find out? Contact your regional Vitronics Soltec HelpDesk to learn more about this and many other process improvements and innovations, including the latest software releases and other recent developments. We are committed to continuous process improvement; our equipment is scalable and upgradable. More information will be published in this column, on the Vitronics Soltec web site (www.vitronics-soltec.com) and is available through your local HelpDesk - just ask!

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Soldering Process Clinic



With Dr. Denis Barbini and Dr. Ursula Marquez de Tino

In this issue: Here are some of the most common soldering defects in the wave and selective soldering processes, and some of the preventive steps that can alleviate them.

Got a soldering question?

E-mail it to info@us.vitronics-soltec.com, with 'Soldering Clinic' in the subject line. We'll try to answer it through this column.

Common Soldering Defects for Wave and Selective - and their Cures

Solder Bridging: This is a build-up of solder between leads or pads, causing a short. Solder bridges occur when the solder does not separate from two or more leads before it solidifies.

Preventive actions:

Use a correct design: short component lead length and small pad and pitch between the pins. Use a strong flux and optimize the amount of flux. Use a de-bridging tool if available.

Excess Solder

occurs when too much solder is used to form the joint. Some possible causes are poor solder separation conditions or barrel cracking. Rework is not recommended since it will not improve joint reliability.

Preventive actions:

Optimize drainage conditions by using a different wave former.

Fillet Lifting: This is a condition in which the solder joint lifts off the PCB as the board cools and contracts after the soldering process. The primary reason for fillet lifting is a coefficient of thermal expansion mismatch of the materials used.

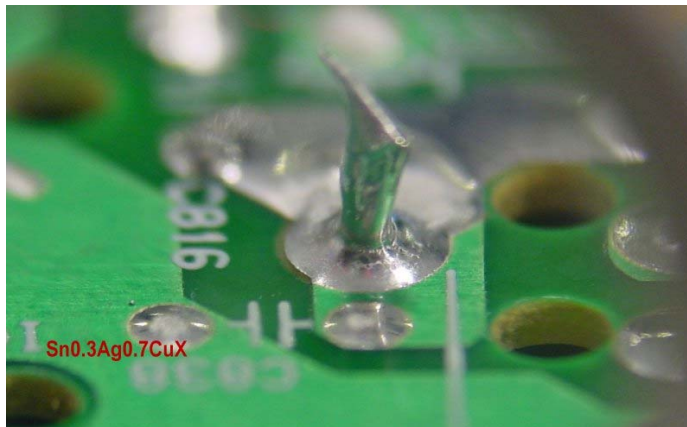
Preventive actions:

Keep solder temperature low, avoid low melting alloy combinations, and do not use Sn/Pb finished components.

Pad Lifting is a condition in which the solder pad lifts from the PCB as the board cools and contracts after the soldering process. The primary reason for fillet lifting is coefficient of thermal expansion mismatch of the materials used.

Preventive actions:

Keep solder temperature low, avoid low melting solder contaminations, and optimize material selection.



Solder Spikes

(PHOTO, left): These occur when excess solder solidifies in a long-drawn pointed form on pads or terminations.

Preventive actions:

Use a stronger flux or use nitrogen.

Solder Balling: Occurs when tiny balls form around components. An increased incidence of solder balling may be seen with some solder masks due to the increased soldering temperatures associated with lead-free soldering. Solder balls in between the pins may be caused by poor flux activity.

Preventive action:

Change solder mask, optimize solder temperature, or correct flux.



Connections is the quarterly newsletter of Vitronics Soltec, the world's leading supplier of Wave, Reflow, and Selective Soldering systems, and the premier source of soldering technology knowledge and process expertise globally for nearly a century. For more information, visit www.Vitronics-Soltec.com. ©2009 Vitronics Soltec