NEWS

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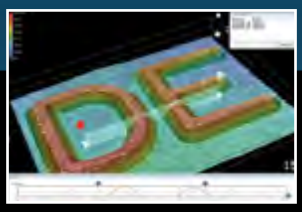
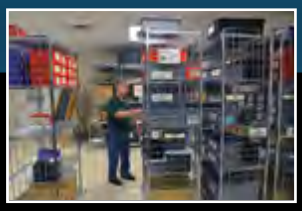
sti electronics, inc.

Leading the way in electronics





DAVE'S WORLD

By: Dave Raby

June, 2015

I've mentioned before that we like to celebrate at STI. We recently celebrated three special anniversaries. We celebrated Frank Honyotski's 15th Anniversary with a big cake and stories about him. Many of you have been to class at STI and had Frank Honyotski as your instructor. Even if you haven't had him as an instructor but have been to STI, you've probably heard Frank's voice. Frank is loud, but simply one of the best instructors around. I appreciate his 15 years with us and look forward to many more. We celebrated Christy Hill's 10th anniversary at STI. Christy started in accounting with us as an accounting clerk and somewhere along the way became Diana's assistant. She does a great job helping an overworked Diana as well as handling a lot of issues on her own. Christy received our traditional 10th anniversary package which included a $1,000 bonus plus some extra time off and a big cake. Christy's celebration was a little different than normal simply because it is one of the first that she didn't do the planning for. We'll be glad to have her back doing that for some upcoming July anniversaries and beyond. We also celebrated Chuck Callahan's 10th anniversary. Chuck works in our kit room where he helps put training kits together and fills orders for all of our training materials. Additionally, Chuck helps as needed in shipping and receiving and is one of our trained emergency medical responders. Chuck received the same package as Christy including $1,000, some additional time off, and a really good cake.

I'm happy to announce that Connor Johnson has recently transitioned to full time status in our engineering department. Connor has been with us for several years as a part time employee as he pursued his Electrical Engineering Degree. We have also added David Podolski as a Mechanical Engineer. Both David and Connor are recent graduates of UA Huntsville and we are fortunate to be able to add them to our staff.

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I've heard it said that a friend is someone you can call to help you move while a true friend is someone you can call to help you move a body. As I've gone through life, I've been very blessed to have many friends and acquaintances and a few true friends. I'm very proud to say that JoAnn Stromberg, Executive Administrator of the SMTA, has been one of those very true friends for many years. JoAnn officially announced that she'll be retiring at the end of this year and I couldn't be happier for her. I've rambled on these pages for many years about my love for the SMTA and JoAnn is the one that has shaped it to be the way it is. JoAnn has also been very important to my development both personally and professionally. She's always been a great sounding board and a great encourager. I remember multiple occasions where we'd be having dinner at a pretty spectacular location (a rooftop overlooking Hong Kong or a spectacular sunset in Hawaii) and we'd talk about how fortunate we had both been to come from small towns without a lot of advantages and then get to know and appreciate so many people in so many parts of the world. She did once lead me through some old apartments into a scary back alley in Shanghai where we were locked in a small room and I was fairly sure we were both going to die but I've mostly forgiven her for that one. (That could end up being an entire article once I'm confident the statute of limitations has run out.) Her retirement has been talked about inside the SMTA for many years (I know it was when I was president in 2004-08) but a big part was waiting until JoAnn felt the time was right and she found the right replacement. Tanya Martin has been doing a great job learning the organization for the past year and will continue to do a great job stepping into JoAnn's role. JoAnn will deservedly get to spend more time with Bert and hopefully with grandkids and definitely enjoying life. I'll miss her in her professional capacity but she will always be a true friend. The SMTA will be hosting a party for JoAnn on September 29th which is the Tuesday night of SMTAI. I don't know many details at the moment but save the date and be there if you can.

We all sit around and complain about what is going on (or not going on) in Washington, DC and how it affects our ability to operate a business. I finally did something about it. I joined a group of other business owners & executives from the electronics manufacturing industry at IMPACT which is organized by the IPC's Washington office and spent two days on Capitol Hill in with Senators, Representatives, and White House Staff discussing a variety of subjects regarding how to help the electronics manufacturing industry and how not to further harm the industry. It was interesting, educational, fun, and I think beneficial. I was impressed by the officials we met with. All are trying to do what they think is right but operating in a system where change doesn't happen easily. Obviously, our visit isn't going to fix all of our nation's troubles but hopefully it will help steer us to some steps in the right direction. I'm very appreciative of the work IPC's John Hasselman and his staff did organizing this event and I encourage you to participate in similar events in the future.

Thank you for your support and please let us know if there is anything we can do to serve you better.

Please follow me on twitter (@STIelectronics) or facebook (STI Electronics).

KEYENCE VHX DIGITAL MICROSCOPE

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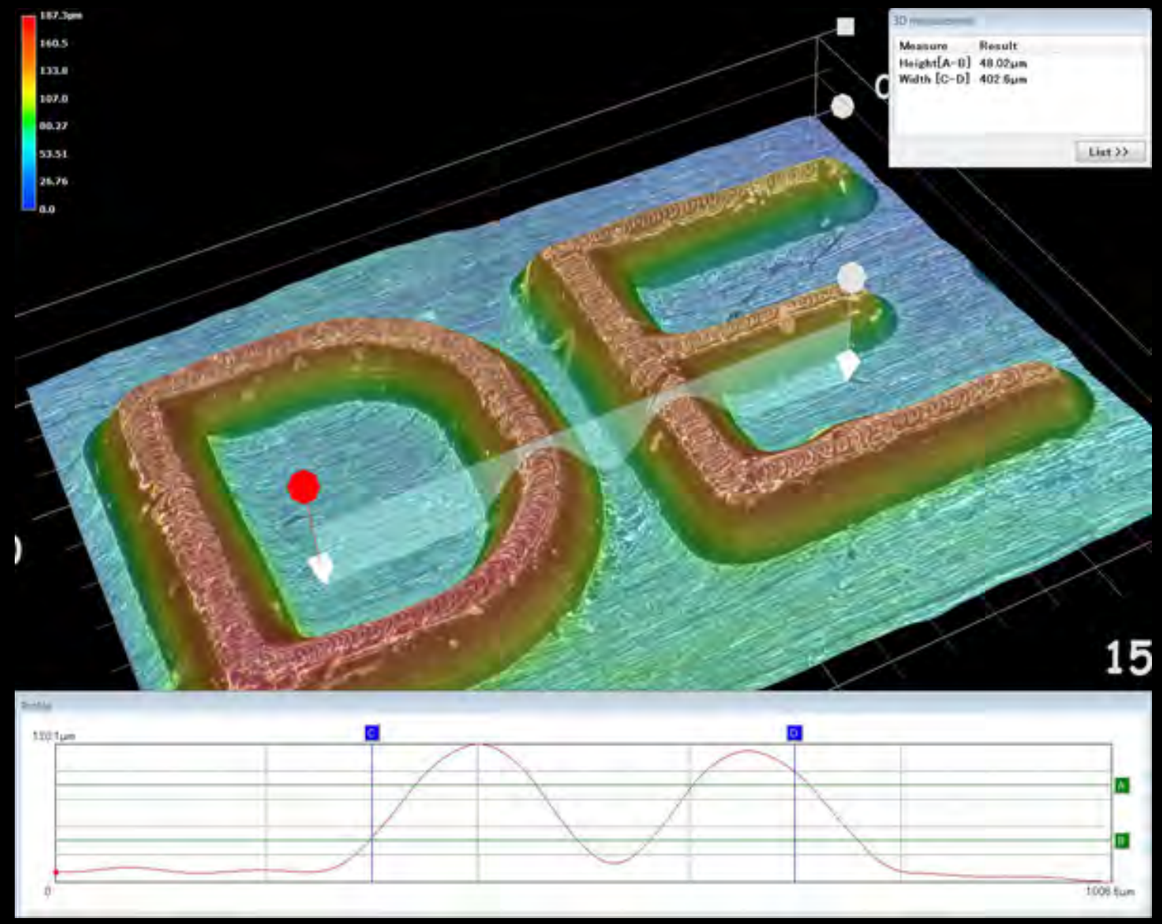
STI's Analytical Lab has some exciting new technology to share with you. To our already existing arsenal of multiple analytical tools to help you find answers to your failure- and material analysis needs, we have added yet another exciting piece of digital high resolution imaging: the Keyence VHX digital microscope.

This free-angle observation Keyence high-resolution digital microscope is able to achieve a 20x greater depth of field when compared to a typical optical microscope. This allows objects with large variations in surface topography to be focused and accurately observed in a single image. Even at higher magnifications you can obtain a fully-focused image. Our system has a wide range of 20x-2500x magnification.

Images can be generated in either 2D or 3D display. After collection of either a 2D or 3D image, we can perform real-time measurements of distance, angle, radius, areas, etc. and three-dimensional measurements such as profile and volume.

The variable angle option allows observation of a sample from all directions. By adjusting the viewing angle of the camera and lens, no detail is ever missed.
Please let us know if you are in need of some digital microscopy services. The STI Analytical team is available for assistance.



TRAINING SERVICES

Stress Relief and Leadless Parts

Contact Information:
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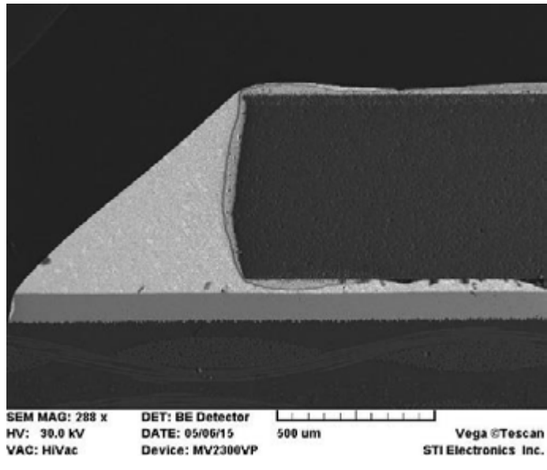
Stress relief allows for items to move, or "give" during expansion and contraction and shock or vibration and dissipate mechanical stresses in a controlled manner.

Solder connections can fail as a result of ageing and stresses. The connections can develop fractures that will lead to intermittent and/or complete electrical failure. The best way to reduce the occurrence of this failure mechanism is to provide a flexible portion of the connection that will reduce the amount of stress being directly applied to the solder connection and distribute those stresses evenly over a much larger area.

In the past, when leaded through hole components were prevalent, this was easily accomplished through the use of stress relief bends. Any sharp or abrupt transition can become a focal point for stresses causing them to be more localized. The focusing or localization of the stresses causes reduced reliability because the effect of is greater when focused on a small area than when the stresses are distributed evenly over a much greater area. This knowledge resulted in requirements and criteria for the bend radius of leaded components. A very sharp lead bend radius will tend to focus stresses, while a more gradual larger lead bend radius will tend to distribute the stresses. This stress relief method became more challenging with the introduction of surface mount components.

In the F revision of the IPC J-STD-001 Clause 7.4 states; Surface mounted device leads or components shall not [N1N2D3] be pressed down against the PCB land or other mating surface during the soldering operation or during solder solidification. Clause 7.5.2 further states; Dimension (G) (which is the solder thickness) is the prime parameter in the determination of solder connection reliability for leadless components. A thick (G) is desirable.

In the absence of stress relief lead bends the solder becomes the only form of stress relief. Since stress relief forms or shapes cannot be configured from the solder connections of leadless SMT components, a taller or increased thickness of solder will be needed to allow the solder to slowly deform providing some degree of stress relief.



This "hold down" clause doesn't really apply to the automated SMT process because most of the component placement equipment is programmed to lightly place the component into the solder paste deposits. Hand soldering is another story.

Previously, the solder bump method was used to hand solder rectangular chip style components. Because this method required the hold down of the component during the soldering process, it no longer meets the requirements of the F revision of J-STD-001. The "hold down" during the solder solidification results in a very thin solder thickness (Dimension G). This very thin solder thickness will not be able to flex or deform as easily as a more significant solder thickness.

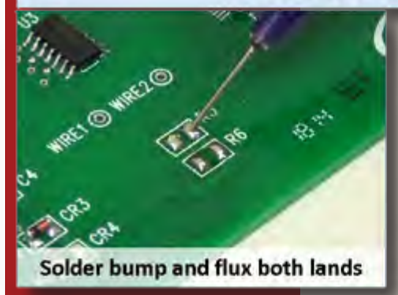
TRAINING SERVICES

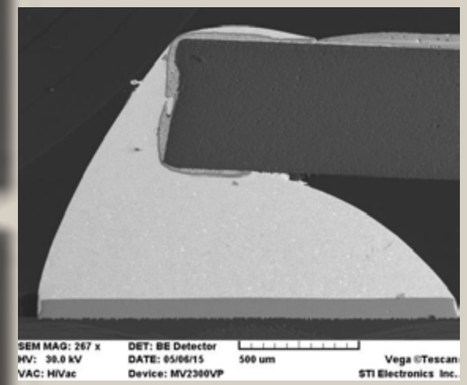
Solder Bump Method

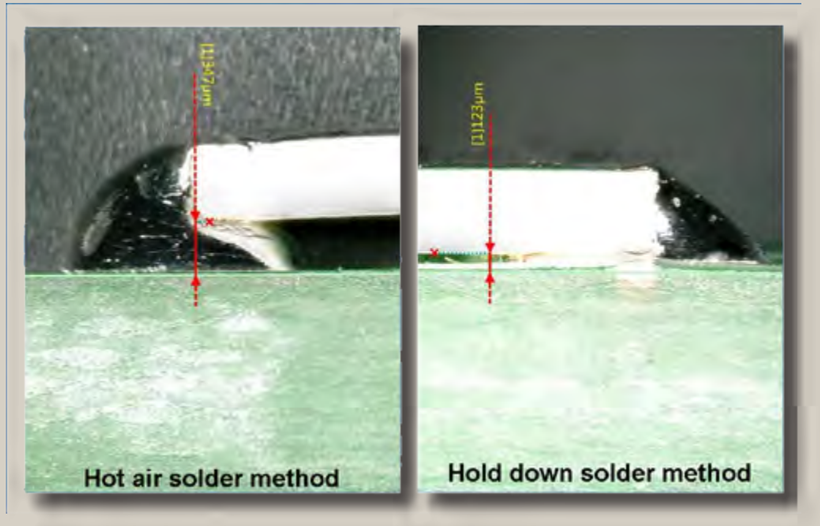
When performing manual soldering operations, the hot air soldering process is a good method for achieving a greater solder thickness. Although the hot air method can be accomplished with solder paste, it is usually easier (and less messy) to prepare solder deposits, or bumps. First we need to apply solder bumps to both lands on the board. After cleaning, we'll apply some flux. Tacky flux will work the best for holding the component in place. Now we'll carefully place the component on top of the solder bumps placed as accurately as possible. Using a hot air pencil tip, direct the hot air flow straight down (not from the side) from a distance and slowly bring the tip in closer until solder melt is observed. Once solder melt is achieved, allow sufficient time for the solder to flow and wet the metallized surfaces. Then slowly withdraw the hot air heat source and allow the connections to cool back down to room temperature. Clean the flux residue if required. In this manner, no external pressure has been applied to the component and it will tend to "float" on the solder deposits. This leaves a much greater solder thickness.

When comparing a chip component soldered using the traditional method of pressing down while using a soldering iron and the chip component that was soldered using hot air, it is easy to see that the hot air method provides a much greater solder thickness (dimension G) than the soldering iron method. Which should, in turn, provide greater long term reliability. Keep in mind that the J-STD-001 requirement concerning hold down, only applies to Class 3 product. Will your device continue to function normally in most ordinary end use environments? Probably. This requirement will definitely enhance long term reliability in harsh end use environments. It may be time to put those wood sticks and soldering aids back in the drawer.

Hot Air Method



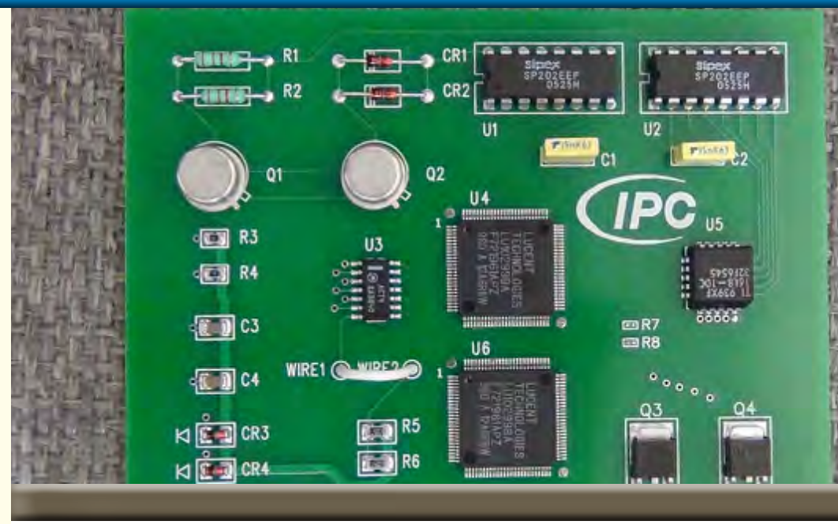




Acknowledgements: Cross-sections and SEM micrographs provided by STI Electronics Analytical Services.

Follow us on our social media sites for a chance to win an iPad mini. A name will be drawn from our followers.

iPad mini



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Summer is here and it's time for "in with the NEW" But the old ones are still here.

Many of you are aware of the dramatic changes in IPC Training and Certification programs over the past few months. From CQI and the electronic On-Line testing to electronic training curriculum materials, and a NEW training board for J-STD-001 skill demonstration. That is a lot to take in!

The NEW Training board is very similar to the previous one we put together in 1998 with three changes at the request of the 001 Training Committee last fall. The committee added two QFP100s (20mil), two DPAKs, and two 0402 Resistors. The Committee's goal was to add a degree of difficulty to the previous board and our working group determined that additional QFP should be available for practice, if necessary. The new Lead Free board is now available in Lead Free HASL surface finish, which offers some benefits when compared to the previous Immersion tin (IMSn) finish. For those of you using the NEW design, I'd like to have your feedback, let me know what you think about the quality, price, and ease of use. So far, the feedback has been positive.

Good News for those that like the old design. It's still available in both Tin Lead and Lead Free versions from STI! We will continue to offer the old design kits until there is no more demand.

Our feature Kit this month is our NEW 001 Certification Kit your choice either Lead Free (HASL LF) or Tin/Lead. Mention this article and receive a 10% discount during the release month. Discount is valid through August.

Best regards,
Mel

We Are Giving You More Choices.

Order Online

Now you can purchase any of our training kits and components including IPC materials at either of our e-store locations.

amazon.com

To Visit our NEW Amazon Store, go to:

http://sti-electronics-inc1.hostedbywebstore.com

or

http://estore.stielectronicsinc.com

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STI Electronics Training Services Houston Special

Win an iPad mini 2!

Register and attend the following classes at our Houston facility to be entered into a drawing for a free iPad mini 2

IPC-A-600 CIT Certification	August 3, 2015
IPC/WHMA-A-620 CIT Certification	August 11, 2015
IPC J-STD-001 CIT Certification	August 17, 2015
IPC-A-610 CIT Certification	August 25, 2015

Drawing to be held on September 4, 2015
Winner will be notified by email

STI's Training Services

2015 Schedule

TRAINING SCHEDULE

J-STD-001 "Requirements for Soldered Electrical and Electronic Assemblies"

J-STD-001 Certified IPC Trainer (CIT) Certification Course - Madison, AL

August 3-7
September 28-October 2
December 7-11

J-STD-001 Certified IPC Trainer (CIT) Recertification Course - Madison, AL

July 29-30
September 23-24
November 18-19

September 2-3
October 21-22
December 16-17

J-STD-001 Certified IPC Trainer (CIT) Space Addendum Course - Madison, AL

July 31
September 25
November 20

September 4
October 23
December 18

J-STD-001 Certified IPC Application Specialist (CIS) Certification Course (Modules 1-6) - Madison, AL

Available upon request

J-STD-001 Certified IPC Application Specialist (CIS) Recertification Course (Modules 1-6) - Madison, AL

September 9-11

IPC-A-610E "Acceptability of Electronic Assemblies"

IPC-A-610 Certified IPC Trainer (CIT) Certification Course - Madison, AL

July 13-16
December 14-17

October 5-8

IPC-A-610 Certified IPC Trainer (CIT) Recertification Course - Madison, AL

July 27-28
September 21-22
November 16-17

August 31-Sept 1
October 19-20
December 14-15

MSFC/NASA-STD-8739.4 Cable Harness Certification Operator/Inspector

September 14-18

MSFC/NASA-STD-8739.1 Staking and Conformal Coating Operator/Inspector

August 31-September 3

IPC/WHMA-A-620 "Requirements and Acceptance for Cable and Wire Harness Assemblies"

IPC/WHMA-A-620 Certified IPC Trainer (CIT) Certification Course - Madison, AL

August 17-20

December 1-4

IPC/WHMA-A-620 Certified IPC Trainer (CIT) Recertification Course - Madison, AL

September 10-11
November 12-13

October 26-27

IPC/WHMA-A-620 B Certified IPC Trainer (CIT) Space Addendum Course - Madison, AL
Prerequisite: IPC/WHMA-A-620B CIT Certification or Recertification Course.

August 24-28

November 16-20

IPC/WHMA-A-620 Certified IPC Application Specialist (CIS) Certification/Recertification Course - Madison, AL

October 28-30

TRAINING SCHEDULE *cont.*

IPC-7711/7721 Rework, "Modification and Repair of Electronic Assemblies"

IPC-7711/7721 "7721B Rework, "Modification and Repair of Electronic Assemblies"

IPC-7711/7721 Certified IPC Trainer (CIT) Certification Course - Madison, AL

July 20-24

November 2-6

IPC-7711/7721 Certified IPC Trainer (CIT) Recertification Course - Madison, AL

September 10-11

October 28-29

IPC-7711/7721 Certified IPC Application Specialist (CIS) Certification Course - Madison, AL

November 9-17

IPC-7711/7721 Certified IPC Application Specialist (CIS) Recertification Course - Madison, AL

November 2-3

STI's Training Services Houston, TX

2015 Schedule

TRAINING SCHEDULE *cont.*

J-STD-001 "Requirements for Soldered Electrical and Electronic Assemblies"

J-STD-001 Certified IPC Trainer (CIT) Certification Course

August 17-21

J-STD-001 Certified IPC Trainer (CIT) Recertification Course

July 16-17 September 24-25
October 15-16

J-STD-001 Certified IPC Application Specialist (CIS) Certification Course (Modules 1-6)

September 14-18 November 2-6

J-STD-001 Certified IPC Application Specialist (CIS) Recertification Course (Modules 1-6)

September 21-23 October 12-14

IPC-A-610E "Acceptability of Electronic Assemblies"

IPC-A-610 Certified IPC Trainer (CIT) Certification Course

July 20-23 August 25-28
October 20-23 December 1-4

IPC-A-610 Certified IPC Trainer (CIT) Recertification Course

November 9-10

IPC-A-610 Certified IPC Application Specialist (CIS) Certification/Recertification Course

July 27-30 September 9-12
December 7-10

CCH-100 Crimping Course - 4 Hours

July 23 July 30
December 10

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