

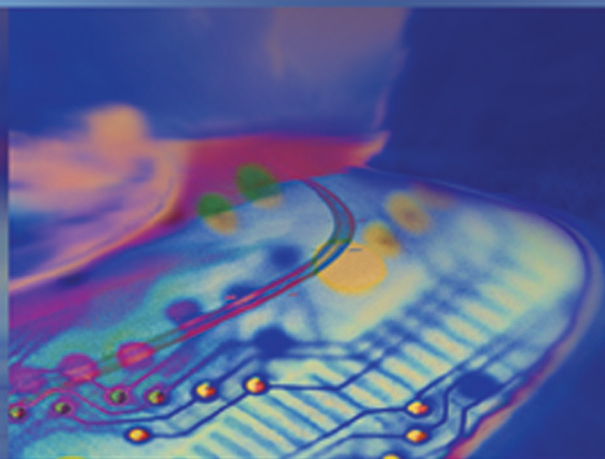
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"Woman Owned Small Business"

Volume 6, Issue 6

October 2007



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We are still working through all the permit steps on the new building and during the process the building continues to grow. Current plans now call for a little over 53,000 square feet. I still hope to be moved in during the Fall of 2008. As soon as dirt starts moving, we will begin posting photos on our web site so you can see the progress.

Our Engineering Services Department is now ISO 9001:2000 certified. Mel Scott and his team did a great job getting us prepared for the audit and now everything is official. Some of the things you go through for any type of audit are formalities to pass an inspection but I am pleased that we have learned and implemented several procedures from this process that will continue to improve how we operate.

Traveling (always an interesting subject and a perk) ... A few weeks ago I was sitting in a plane thinking of how lucky I was to have the entire exit row to myself and anticipating an unusually peaceful and relaxing flight from Memphis to Tampa. That's when the flight attendant walked up to the row directly behind me and asked a very large man "Other than anxiety attacks, are there any other medical conditions we should know about?" Wasn't exactly the relaxing flight I had hoped for.

We will be completing a new web site soon so check often to see the changes (www.stielectronicsinc.com). Speaking of websites, my all time favorite web site to use is Amazon.com. I buy a lot of books and other things there and admire their overall website and particularly their artificial intelligence software which is usually fairly good at saying "if you liked this book, you'll probably like this one too..." The last three books I bought were all biographies, George Washington, Albert

Einstein, and John Adams. Then I received an e-mail from Amazon saying if you liked those, you'll love "Don't Hassle the Hoff, The Autobiography" by David Hasselhoff. I did mention they are usually pretty good. I promise we won't be suggesting such literary classics as "Don't Hassle the Hoff" from STI's website.

Every time I hear of a recall of products made in China because of lead, I remember being in Hong Kong a couple of years ago and basically being chewed out by a Chinese government official who kept wanting to know why Americans were so slow to adopt lead free manufacturing when the Chinese had been doing it for years. I doubt he remembers the conversation now.

In the previous newsletter, I asked you to e-mail me if you wanted to switch from the paper copy of this newsletter to the electronic version. I even offered a reward of \$1.00 to charity for every person that switched. I was hoping for hundreds but I'm proud of the seven of you that did e-mail me. Thank you Wendy, Rich, Allen, Pam, Angie, Nelson, and Chris. Seven dollars has been sent to the Jim D. Raby Scholarship Fund at Calhoun Community College. If anyone else would like to switch, just e-mail me to let me know.

Thank you for all of your support in August that turned out to be one of STI's best months ever. Please let me know how we can serve you better.

David E. Raby

President/CEO

draby@stielectronicsinc.com



David Raby presenting Ann Duncan, Training Services Coordinator, with a cruise for 10 years of service. Joining in on the celebration is Ann's husband Edward.



Training Services 2007: *Schedule*

Madison Alabama



October

- Oct. 15-18 MSFC/NASA 8739.1 Staking and Conformal Coating Certification
- Oct. 22-23 IPC J-STD-001 CIT Recertification
- Oct. 24-25 IPC Rework/Repair and Modification Certified IPC Trainer (CIT) Recertification
- Oct. 24-25 IPC-A-610 CIT Recertification

November

- Nov. 5-8 IPC-A-610 CIT Certification
- Nov. 26-27 IPC Rework/Repair and Modification Certified IPC Trainer (CIT) Recertification
- Nov. 26-30 IPC J-STD-001 CIT Certification
- Nov. 28-29 IPC/WHMA-A-620 CIT Recertification



Ann Duncan
Training Coordinator

Ivy Tech (Bloomington, IN)

- Oct. 9-11 IPC-A-610 Certified IPC Specialist (CIS) Certification
- Nov. 26-30 IPC J-STD-001 CIS Certification

To register for a course or for additional information go to www.stielectronicsinc.com or e-mail us at training@stielectronicsinc.com.

Training Services: **STI Electronics Announces New Course**

By: Dan Foster, Director of Training Services



Dan Foster

STI Electronics, is proud to announce that we are now teaching the IPC J-STD-001DS (Space Applications Electronic Hardware Addendum to J-STD-001D Requirements for Soldered Electrical and Electronic Assemblies). This course provides additional requirements over those published in IPC J-STD-001D to ensure the reliability of soldered electrical and electronic assemblies that must survive the more aggressive thermal cycles and intense vibration that hardware is exposed to during acceptance and/or qualification testing, as well as during launch and mission life. This course is designed for Certified IPC Trainer's (CIT's) and Certified IPC Specialist's (CIS's) who have already been certified to J-STD-001D. The course includes a copy of the J-STD-001DS for both the CIT and CIS. The CIT will also receive training materials to teach the CIS course. To obtain certification, an open book test will be administered.

The course is a minimum of four hours in length. Both the CIT and CIS must achieve a minimum of 80% or higher. Students attending this course must show proof of certification by bringing their original certificate to the class.

For a 2007 course schedule, please visit our website at www.stielectronicsinc.com. For 2008, the course will be given every other month on the day after an IPC J-STD-001D CIT Recertification Course. If you have any questions please email me at dfoster@stielectronicsinc.com or contact me at (256) 705-5527.

Engineering Services: Extreme Damage to Component Die Surfaces

By: Kristi Freeman, Analytical Lab Chemist



Kristi Freeman

As mentioned in the April 2007 Engineering Services article, component decapsulation and internal die analysis is often useful to determine the cause of component failures. This method of analysis is particularly useful when dealing with “during life phase” failures such as electrostatic discharge (ESD) or electrical overstress (EOS) failures.

Occasionally, components will experience severe EOS that can cause extreme damage. Our lab recently received a failure analysis project that exhibited this type of damage. The PCBs that were analyzed had been struck by lightning while in operation in the field. While the boards themselves were intact and looked normal, one component had failed. The component in question was chemically decapsulated to inspect the die and wire bonds for internal damage.

When inspected by scanning electron microscopy (SEM), significant amounts of damage were found on the die surface. Several components from different boards were examined, and all showed the largest amount of damage in the same location on the die, indicating that wire bond connection as the entry point. The exit point was always in the opposite corner of the die, although it varied in the particular wire bond. The damage to the die surface was severe enough to melt the silicon die material through several layers of the die. Several images are included to illustrate the extent of the damage caused by this type of EOS. These examples show the extent of the damage that can be caused by large amounts of EOS, such as from a lightning strike, even when the PCB and components were intact and apparently unharmed from visual inspection. While this amount of damage

is unusual and will only be seen in rare cases, even a small amount of damage from ESD or EOS can cause similar component failures. Chemical decapsulation and SEM analysis continues to provide useful (and in cases like this one, very interesting) information on these types of component failures.

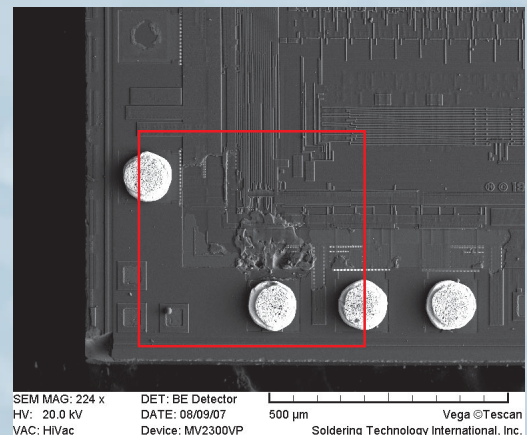


Figure 1 - Exit area showing die damage

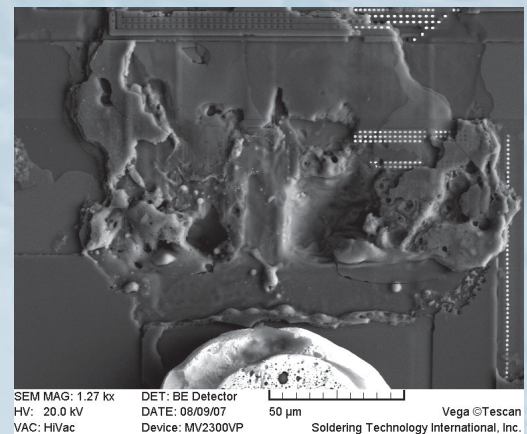


Figure 2 - Damage in exit area

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Engineering Services: Extreme Damage to Component Die Surfaces (Cont.)

By: Kristi Freeman, Analytical Lab Chemist

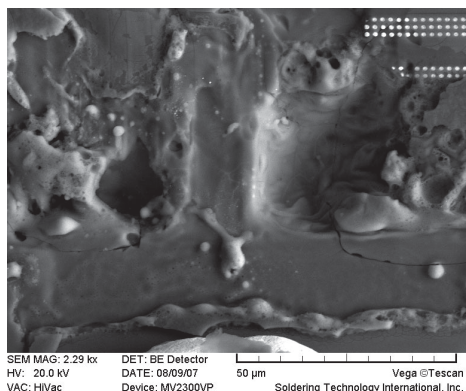


Figure 3 - Close up of damage from Figure 2

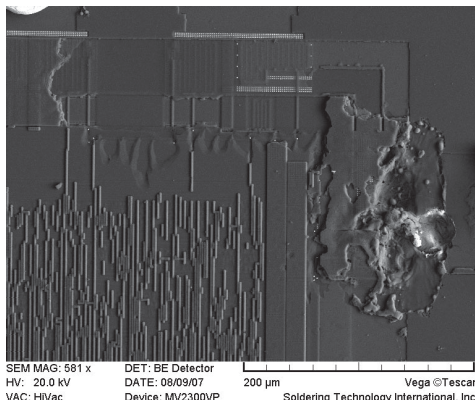


Figure 4 - Entry point area showing die

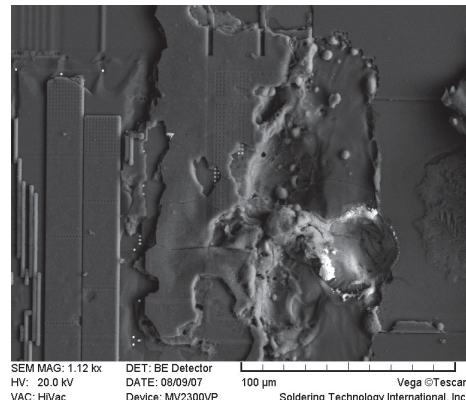


Figure 5 - Close up of entry point damage

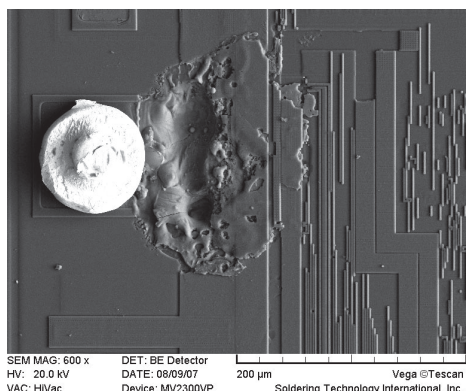


Figure 6 - Additional die showing damage

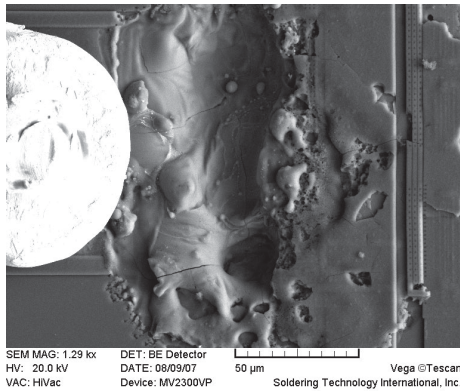


Figure 7 - Close up of damage

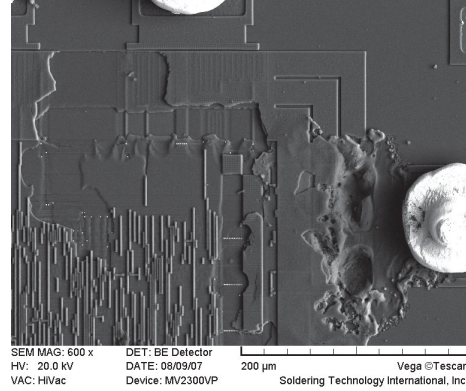


Figure 8 - Additional die showing damage

If you have any questions about this article or need further information on the Analytical Lab's capabilities, please give Marietta Lemieux a call at 256-705-5531.

To receive future issues of STI's newsletter electronically, please go to www.stielectronicsinc.com.

Sales & Distribution: STI Electronics, Inc. Features OK International's MFR Multi-Function Rework Systems

By: Sissie Eckstein, Sales Manager



The new Multi-Function Rework Systems (MFR) not only expertly perform rework, they also have tools for SMT and through-hole soldering. These flexible systems feature two switchable outputs with a comprehensive choice of tools that support today's complex PCB and component technologies.



Sissie Eckstein

Systems are configured with the following tools:

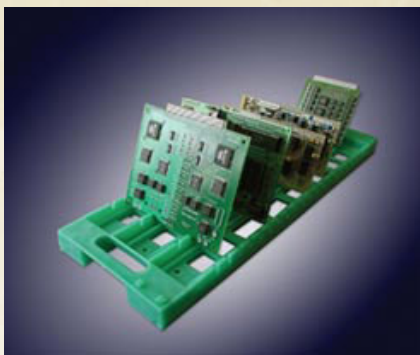
- Soldering and Rework
- Adjustable Desoldering Handpiece
- Standard Tweezer
- Production Soldering
- Precision Tweezers



The MFR Series uses SmartHeat® Technology to deliver the power required for lead-free connections. SmartHeat® Technology's variable power instantaneously senses and continuously delivers the precise thermal energy to the pad, yielding high quality solder joints while protecting sensitive components from damage.

These high performance systems can be adapted to your exact needs, whether it is cost effective production soldering, more complicated rework with cartridges, handling small components with the unique Precision Tweezer hand-piece or performing through-hole desoldering.

Fancort Industries Introduces Green ESD Safe Rack for Lead-Free Boards



RA 20SDG

Fancort is known for their PCB Assembly and Handling products with the largest selection of ESD safe PCB racks for storage and handling. The color-coded RA-20SDG handling rack identifies lead-free PCB assemblies. The ESD-safe green rack uses an RA-20 mold to hold up to 20 assemblies in 0.125" x 0.325" slots with 0.750" pitch.

- Measure 7"x 20", Weight 2 lbs
- 20 Slots with easy-to-load angle, .125" x .325 on a .750" pitch
- Rugged construction with heavy reinforcing ribs
- Open carrying handles and stackable
- Tolerates 185°F
- Surface resistivity of 5×10^{10} ohm/sq



Hakko CHP-170 Medium Cutter

The Hakko CHP-170 cutter is an excellent general use tool. **Features:** Cut: Flush; Max cut: 16 AWG. \$3.25 each, while supplies last.



Training Materials: Features Through-Hole Training Kit

By: Mel Parrish, Director of Training Materials



Mel Parrish

The STI feature Kit of the Month is our Through Hole Training Kit. Historically this board and kit hold a very significant place in the development of quality solder training skills throughout the electronic industry over the last 30 years or so. It would be difficult to find a solder expert or senior operator that didn't learn to solder using these boards and the accompanying wire terminal kits. They were certainly used in all of the Mil Spec Certification programs.



SST-K1

A little known fact concerning these boards, as they were used in the Military Spec programs, is that the component PTHs were intentionally dimensioned at the limit of the allowable "Lead to Hole" ratio to create a challenge for even the most experienced solderer. With WS-6536 the majority of solder connections were required to be optimum (near perfect) for a passing score. This was tough and a lot of times the lab projects came down to the last few connections to determine if the student would pass or not. In my many years at the China Lake Solder Certification School, no one ever produced a perfect board (without Class A or Class B Defects), including me - despite several attempts. So if you were there, and recall it being a difficult experience, the boards may have been a contributing factor.

Considering the evolution of standards materials and processes it's impressive that the kit is still popular today. We currently offer the kit in a full package with a practice and a grading evaluation board with lots of components to work with as well as a Recertification Kit with one board and reduced component count for people that have already demonstrated acceptable skill. By the way, the "Lead to Hole" ratio is better now.

I wonder how many thousands of us learned High-Rel soldering using this Kit. If you have any questions regarding Certification Soldering Kits, contact Mel Parrish at: mparrish@stielectronicsinc.com or (256) 705-5530.

Training Materials: Wire Holding Fixture



Part #405-1026

Have you ever struggled to secure wires without the use of a good Wire Holder? We have just the solution. STI Electronics new Wire Holding Fixture provides stable support for multiple wires. This fixture helps free the operators hands to perform soldering or other operations while keeping the wires secure in the correct location. Wires can be placed in either vertical or horizontal supports for the best alignment. The fixture is compatible with many types of fixture vice heads such as "PanaVice" Models 366 and 376 or others with a 1 3/8" X 1/4" opening. Great for production training or soldering/assembly operations. Contact Mel Parrish at (256) 705-5530 for more information or call (800) 858-0604 to place an order.

Surplus Inventory Sale

STI Electronics, as one of the largest distributors of electronic assembly and solder supplies, occasionally has overstock on some items. We have created a surplus inventory list with prices drastically reduced. The surplus inventory list is available at our website, www.stielectronicsinc.com, and is updated monthly. Please call (256) 705-5545 and ask for Sales or (800) 858-0604. Quantities are limited so don't delay.



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Jim's Corner

By: Jim D. Raby, PE
Technical Director



The last time I wrote this corner I was talking about drifting away into my favorite fishing hole. Well, still didn't do that because David keeps things too exciting around here and I don't have to take it home with me any more. I am late to arrive and early to

leave and I listen to what's going on and sometimes I show some interest and sometimes I don't. In addition, David has started this plan to build a new building and it seems like fun to be a part of that activity. That way I can harass the contractor instead of STI workers.

It is just now getting cool enough to go fishing. It has been so hot that the fish were broiled in the lake. Certainly too hot for me to be out there. So now is the time and I'll be out there next week catching, (not fishing) but catching. Some people enjoy fishing. I don't, I enjoy catching. Maybe next newsletter, I'll put a photo of fish instead of this disgusting photo of me. Then you will know that I catch.

Things are going well. My health is good now and I don't need to work as hard. I get to sleep late (some times) except for an early morning exercise program that Ellen doesn't think could begin later. Ellen's health is good, her temper is mild, and we have just had a great trip through Spain, Greece, Italy, Turkey and some Islands and it was wonderful! Lots of quiet time and no exercise program.



I have not forgotten how this industry has been good to me, and for that reason will never get completely out of it. I still must give back by being available to answer your phone calls and e-mails, so if you have assembly, flux or process problems and desire assistance please give me a call or e-mail.

Jim D. Raby
256 705-5503
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