ANNOUNCING!
ANNUAL SMTA GOLF SCRAMBLE

When: July 16, 2004
Meet at the course by 1:00PM for check in with a shotgun start to follow.

Where: Ridgecrest Golf Club, Nampa Idaho
Four-Star rated by Golf Digest.

Why: You really need a reason? Great company, Great course, Great excuse to be away from work, Great prizes, Etc.

Cost: $31 for SMTA Members, includes Green Fees, cart, and the dinner during the awards ceremony following the game; $41 for non-member guests. Limited to 60 sign-ups.

Great Prizes such as Metcal Ps800 solder stations & Cooper Tools tool kit.

Special thanks goes out to this year’s Golf Scramble Sponsors:
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Join us for a day of Networking, Golf, Food, & Fun!

To reserve spot please RSVP to: debbiep@austinmfg.com
Or 208-573-4772

Todd Monroe
SMTA Golf Chairman
toddm@austinmfg.com

REAL SOLUTIONS FOR REAL PROBLEMS

The History and Importance of SMT Stencils

Author – Mike Ray / IIT

At the front end of every surface mount (SMT) assembly line resides a solder paste stencil. This stencil is a critical assembly element, as it sets the stage for component placement and will ultimately determine the quality of the printed circuit board that rolls off the end of the line. A quality stencil can’t guarantee a quality PCB, but without a precise stencil it’s a virtual certainty that problems will occur throughout the assembly process. In addition, quality stencils can be modified to solve non-stencil-related problems - such as component lead size to pad size plus location differential. The finest stencils are not hard to come by, and they are no more expensive than imprecise stencils – especially when factoring in the cost of re-work. However, the fact that all stencils are not created equal is not a universally known principle. The truth is that there are many factors that affect a stencil’s quality. But, the primary factor in the production of a highly precise stencil is the production method itself. We are going to discuss two of the most commonly used methods to produce SMT stencils: Laser cutting and Chemical etching. Still in use today, chemical etching was one of the first techniques used to manufacture stencils. A direct descendant of the photomechanical
REAL SOLUTIONS FOR REAL PROBLEMS

techniques that pioneered stencil technology, chemical etching uses an acid (ferric chloride) to erode the blank metal plate to creating the stencil pattern. This process requires the development of a photo chem. set from a CAD file that is burned onto a laminated plate. Chemical etching was the state-of-the-art in the 1980’s and early 1990’s, but now is largely viewed as antiquated technology. There are inherent problems with chemical etching, of which the most significant is over-all plate inconsistency. To create a quality chemical etched stencil, a host of variables must be controlled, including: chemset quality and registration, plate cleanliness, dry film adhesion, final chemset registration, exposure to plate, development of dry film, dry film touch up, not to mention quality control. The easiest way to determine if, in fact, your stencil supplier is providing you with chemical etched stencils is to look for the tell tale signs associated with chemical etching. For instance, over etching or under etching caused by clogged etcher nozzles, channels etched on the board side of the stencil, and pin holes – all characteristics of chemical etched stencils, and all of which can cause bridging or solder balling. Simply put, the chemical etching process features numerous variables, and if any one of them goes wrong, the result is extensive and expensive re-work. The latest technology utilized for the production of SMT stencils is laser cutting. Lasers, working in conjunction with computers, are precise cutting tools that don’t fall prey to human error or the imprecise and often unpredictable nature of chemical reactions. Laser cuts feature smooth, precise walls that maximize “paste release” – a critical factor in reliable stencils. But all laser cut stencils are not created equal. And that’s because all lasers are not created equal. Off-the-shelf lasers are often used to cut stencils – and they do an adequate job. However, generic lasers are not finely tuned for the specific purpose of cutting SMT stencils. A properly tuned lamp-pumped, pulsed YAG laser, with precise repetition rates and pulse widths, is, without a doubt, the ideal production tool for SMT stencils. And recognizing precision cut laser stencils is as easy as performing a pre-print stencil inspection. Laser cutting stencil systems can drift out of spec. If not meticulously maintained. This will cause inconsistent stencil performance. To ensure perfect stencil performance, diameter, shape, and size of beam must be critically maintained. Combined with rep rate, pulse width, and power, this hi-tech laser can out perform practically all other manufacturing methods. However, gas blend and purity must also be maintained at constant consistency and makeup to ensure high-performance stencils.

It’s in the History Books now!

It’s in the history books now – our May 13, 2004 chapter meeting was a big success! Our lead free speakers both did an excellent job. Bill McConnell (Heraeus, Circuit Materials Division) did an outstanding job on his presentation: “Defining Lead Free Solder Paste Performance via Novel Quantitative Methods.” If you weren’t able to make the meeting, you may contact him at bcmcconnell@4cmd.com for a copy of his presentation. Bill addressed lead free solder paste, how it’s different from the leaded variety, and how to choose the best paste for your application. We also had Marc Peo, President of Heller Industries, give an excellent presentation: “A Practical Investigation Into the Use of No Lead Solders for SMT Reflow.” His presentation was geared toward lead free reflow – what the profiles should look like, why, and what kind of joints you can expect. Marc has also graciously agreed to send his presentation to anyone who would like on - just contact him at mpeo@hellerindustries.com. I also want to take this opportunity to recognize Phil McCoy, the first recipient of the SMTA Intermountain Chapter BIG Cheese Award. Phil is the President of Austin Manufacturing Systems at the Nampa location. If you haven’t had the chance to meet Phil, you’re missing out. Phil truly is one-of-a-kind! The person nominating Phil stated: “The reason I have nominated Phil is because at the beginning of the year there was a fund raiser for the special Olympics where employees of any company could pull together some funds to make a donation and their boss would have

President’s Corner Continued

to take a plunge into a swimming pool on TV in the middle of a shopping center parking lot in the winter cold. AMS operators gathered up $200 of their own money and to show his appreciation of their charitable contribution, Phil & his wife Linda matched the $200 for a total donation of $400 to special Olympics. Phil showed up at the plunge in the freezing winter cold with many of his employees there on a Saturday to show their support and to laugh at their boss. It was a sight to see and the employees spending their day off to watch their boss was something else. His plunge was broadcast on the evening news. Bottom-line is it is not just a production line those employees come to every day, Phil encourages his employees to do many things including the SMTA.” As you can see, Phil is well qualified for this award. Congratulations, Phil! The runner-up for the BIG Cheese award was Tyler Posey, Product Engineering manager at Preco Electronics. Tyler always makes sure that Preco is a corporate sponsor of the SMTA and supports Kent in his duties as President of the Intermountain Chapter. Besides this, Tyler says “Cheese is one of my favorite foods!” Congratulations, Tyler, on your award! A special thanks to all managers who attended!
SEEKING ARTICLES FROM OUR READERS!!

Share your knowledge!
Help others in our industry and promote your company at the same time.

We are seeking “Tech Tip” & “Real Solutions For Real Problems” articles for publication in this newsletter and on our website. “Tech Tip” articles should be one page or less & “Real Solutions” articles should have more detail one to three pages.

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PRESIDENT'S CORNER CONT.

Last, but not least, I want to give a big THANK YOU to all the people who attended. Without you, our chapter could not succeed. From the feedback I got, I think everyone was well served and came away happy they had attended. A lot of good networking took place, too! Finally, I want to thank the officers who helped me pull this event together: Dave Bell for IIT Inc and AMS for door prizes, Doug Chambers for coordinating sign-in and the money, and Debbie Pruett for arranging our dinner. Plus, I want to thank BSU for hosting the event at their Engineering and Technology building. The classroom and facilities were excellent. Thanks to all! Last but not least, I want to give a BIG thanks to those vendors who sponsored a table at our meeting: Alan Siebenthal with Kirby and Demarest and Brian Marshall with System Specialists. If you haven’t already, be sure and email them and get acquainted. Alan can be contacted at alan@kirbydemarest.com and Brian at brian_ssi@msn.com. These gentlemen have excellent products and offer great service, too! Don’t forget our golf scramble in July – I can guarantee it will be a blast! And don’t forget our meetings in September and November. September’s will be on implementing lead free and for November we’re looking at “Lean Manufacturing” and/or “Kaizen Principles”. We’re currently scheduling next year’s events so if you’ve got any ideas or requests, please send them to me at klangston@preco.com. That’s it for now. We’ll see you at the golf scramble! ■
**JULY 2004**

Mark your calendars for Sept 9th!

Intermountain SMTA will be holding their Sept chapter meeting in Salt Lake City at Evans & Sutherland, located in The Research park. Paul Vianco will be speaking on no-lead.

Any questions or comments about the upcoming SLC meeting, contact:

David Bell
dbell@es.com

**EVENTS CALENDAR**

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**Local**

- July 16 SMTA Golf Scramble
- Sept 9– Chapter meeting in Salt Lake City “no-lead implementation”
- Nov 13– Chapter meeting “Lean Manufacturing”

For more info on local events, visit: [www.smtaboise.org](http://www.smtaboise.org)

**National**

- July 20-21 Harsh Environment Electronics Workshop, Dearborn Michigan Hyatt Regency
- Aug 2– Deadline to submit Abstracts for Pan Pac papers

For more info on national events, visit: [www.smta.org](http://www.smta.org)

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Premier SMT stencil manufacturer Integrated Ideas & Technologies (IIT), utilizes proprietary laser technology to create superior stencils. Exceeding the industry standard in cutting technology, IIT’s lasers feature proprietary optical tuning cavity technology to produce an exacting laser spot diameter of less than 0.001 combined with tuned rep rate and pulse width. The result: ultra-precise walls and superior paste release.

**Integrated Ideas & Technologies**

Sharon Shepard 208-665-2166
Sharon@integratedideas.com

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**Integrated Ideas & Technologies**

Sharon Shepard 208-665-2166
Sharon@integratedideas.com
**About Us:** The Surface Mount Technology Association, established in 1984, is a non-profit international association of companies and individuals involved in all aspects of the electronics industry. The Association is dedicated to the advancement of the electronics industry through member education and interaction. The SMTA is privileged to have a membership that is willing to help one another and that contributes to its pool of knowledge. Its members actively seek out the latest in education and techniques, and they work energetically to advance the industry.

Non-members find out about becoming an SMTA member. [http://www.smta.org/membership/membership_step_1.cfm](http://www.smta.org/membership/membership_step_1.cfm)

**Mission of the SMTA**

The SMTA membership is a network of professionals who build skills, share practical experience, and develop solutions in electronic assembly technologies and related business operations.

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**Spotlight**

This month's spotlight member is Mike Ray. The SMTA is grateful for the support Mike provides to our chapter, through his sponsorships & feedback to help improve our meetings and encourage membership growth. Mike Ray began back in the early seventies working closely with his father, Lorry Ray, pioneering the development of photo techniques for circuit boards. However, it wasn’t until the 80's that he began making stencils. Mike has extensive knowledge of the SMT process and was featured in the March 2004 issue of SMT magazine regarding “Stencils as Problems Solvers”. He has also been a speaker for SMTA. The Coeur d’ Alene Chamber of Commerce has recognized him in their local community for his excellence in business. Both he and his wife Karen strive to treat their employees well and it has earned them great respect and a loyal crew.

Thank you again & again Mike!

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**INTERMOUNTAIN CHAPTER**

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