

## Another Breakthrough... SURFACE MOUNT HEADERS WITH CAPILLARY ACTION

Surface mount technology continues to be a growth area with design and packaging engineers and with this increasing interest comes the question how can we consistently achieve reliable connections. In his technical paper delivered at NEPCON West last February, Zierick's Janos LeGrady answered that question by explaining how capillary action works on the molecular level in relation to packaging of electronic components using an in-line surface mount process.

Using this principal, Zierick developed a unique header assembly that demonstrates a pin retention force that is 50% higher than that of J-Lead type headers. Higher retention may be attributed to 1) a thin layer of solder achieving a stronger bond than a thick layer, and 2) smaller voids due to outgassing because the capillary tube gives the gasses a path to escape. Both factors are the result of capillary action forming the joint.

In addition, because the pin is drawn flat to the PCB surface, rather than the surface of the melted solder, co-planarity problems are eliminated. The capillary action pulls the header into proper position over the solder pad — even if the part has been placed off-center.

### Header Design

The header assembly is designed with a circular solder pad on top of the board and a square solder pad on the bottom which are connected to the conductive plate of the through hole. The size of the hole holds the square pin in place, while leaving four cavities defined by the flat side of the pin and the curved wall of the hole. It is these cavities that promote the capillary action by drawing most of the melted solder up through the cavities. At the top side of the header assembly board, the solder forms a ring that is a visual indication that the reflow process is perfect and complete. Further, because the header base is made of the same material as the PCB, there are no thermally induced stresses on the solder joint — long term reliability is guaranteed.

Deep score lines run across both sides of the header base, the assembly is very flexible and can accommodate board warpage without weakening connections.

The PCB that receives the header assembly must have surface mount solder pads of the same size and located at the same pitch as the solder pads located on the bottom side of the surface mount header assembly. The solder paste is stenciled over the pads on the PCB and the header assembly is placed over the solder paste in such a way that the solder pad on the



Come visit our web site, which offers in-depth product information, technical support, and many other features. The address of the site is [www.zierick.com](http://www.zierick.com). We are constantly updating and adding to the site to provide our customers with better service and the latest information about interconnection solutions like our new *Catalog 36*. Check it out! Coming soon: *Catalog 35, Interconnection Hardware*.

receiving PCB and the solder pad on the bottom of the assembly are aligned.

### Benefits

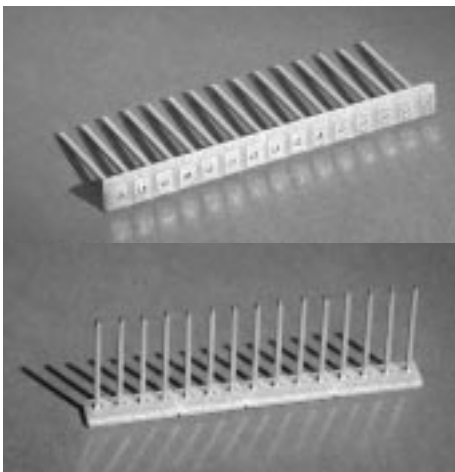
The benefits of Zierick's pin header assembly are many:

- 50% higher pin retention force (compared with J-Lead headers)
- Co-planarity problems eliminated, even on warped boards
- Broader placement tolerances
- Visual indicator assures quality processing
- Highest resistance to thermal shock and thermal cycling
- Minimal real estate required on board

*Continued on inside page...*

## Assembly Technology

Visit Zierick in Booth #22023 at *Assembly Technology* in the Rosemont Convention Center in Rosemont, IL, September 21-22. Zierick will demonstrate its new 9700 semi-automatic terminal insertion system, its 9718 Auto Assembler for PTH, and its Surf Shooter SMT™ Surface Mount Presentation System.





## Zierick in the Media

or the complete text of Janos LeGrady's technical paper, "How to Improve Surface Mount Components and Packaging with Capillary Action,"

see the article in the July issue of *EP&P Europe*.

And don't miss the May issue of *Connector Specifier*, where you'll read how Zierick was able to help System Sensor

when the company redesigned a line of fire alarm systems.



## Surf-Shooter SMT™

Because the Surf-Shooter SMT™ solves so many problems associated with odd-form terminal placement, it has earned its place as the industry standard for integrated parts presentation systems that mount onto the feeder rack of pick and place machines.

Working independently of the machine, it feeds, shears, and presents a continuous reel of stamped interconnection terminals to the pick-up nozzle. Because the odd-form parts that it feeds are stamped, this simple device eliminates the need for expensive time, labor, and capital equipment in going off-line for robotic or manual fixturing.

The Surf-Shooter SMT™ has the further benefit of assuring positional accuracy during reflow. The odd-form terminals used in the Surf-Shooter SMT™ exhibit a capillary wicking action that prevents lateral movement by the terminal during reflow and ensures a high quality solder connection.

This breakthrough connector system operates with virtually any standard placement system including Universal Instruments, Panasonic, ZevaTech, Sanyo, Siemens, and others.



Odd shaped parts can now be assembled in-line on existing placement equipment

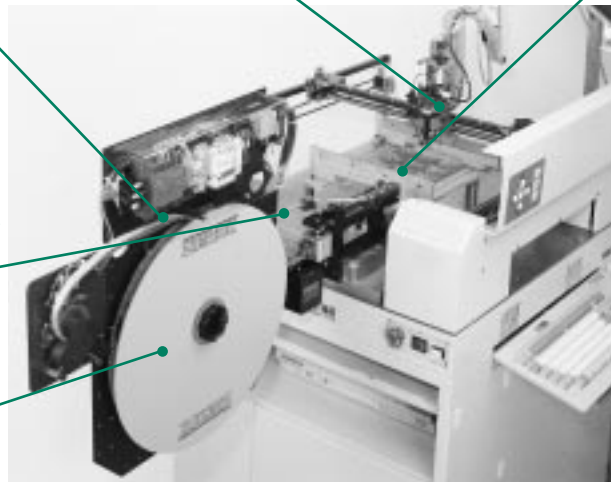
Surf-Shooter SMT™ Presentation System Supplied to Fit Customer's Specific Placement Machine

Placement by Vacuum Pick-up

Continuous Surf-Shooter SMT™ Connector Separated and Presented to Vacuum Pick-up

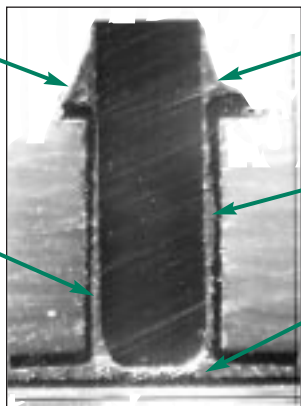
Continuous Surf-Shooter SMT™ Connectors, Pins, Posts, IDC's, Test Points, Receptacles, Etc.

Continuous Reel of Surf-Shooter SMT™ Connectors, Pins, Posts, IDC's, Test Points, Receptacles, Etc.



The melted solder rises through the cavities and forms a ring at the top.

The capillary action provided by the four cavities (formed between the pin and plated through-hole) will pull up the melted solder, resulting in a stronger solder joint.



This ring indicates that the reflow process is complete.

The pin is soldered into the plated through-hole at the same time the header is soldered to the PCB board.

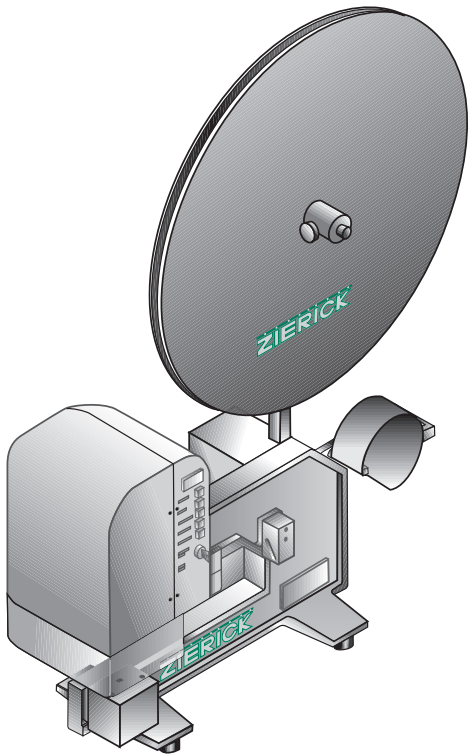
The force which pulls the melted solder into the cavities will also pull the header board assembly and the PCB together.

### "Zierick Headers" Continued from cover...

There is no doubt that miniaturization will continue in certain applications. And as long as we can continue to exploit physics on the molecular level, as with capillary action, Zierick will continue to lead the way with reliable interconnection products.




# New Semi-Automatic Terminal Insertion System



The introduction of Zierick's Model 9700 semi-automatic terminal insertion system at NEPCON West was a big success. The new system handles low to medium volumes of Zierick's wide range of PCB terminals and connectors at speeds up to 5,000 pph. Modular tool sets make changeover from one set to another faster and easier for the operator. In addition, all controls and pneumatic parts are off-the-shelf components to facilitate maintenance. The new 9700 accommodates PCBs from 0.030" to 0.120" thick and up to 30" square.


The Model 9700 also features an automatic actuation system to improve productivity. A locator light assists positioning of PCB hole(s) over anvils. During the insertion cycle, all terminals are automatically splayed and locked into place. An obstruction sensor aborts cycling if a foreign object interferes with operation.

## ASK THE EXPERTS

 : At what point does it make sense to upgrade my insertion equipment to a semi-automatic or fully automatic system?

 : Zierick provides insertion equipment for low/medium/high volume requirements. We routinely help our customers understand when it makes sense to upgrade their insertion equipment, even offering assistance with justification of new equipment. As each customer situation is different, we welcome the opportunity to discuss maintenance costs and how purchasing terminals in larger volumes can result in net savings. So when considering a 9700 or 9718 please help us understand your requirements so we can help you select the right equipment.

## Zierick Welcomes...

 Robert M. Plinske was named Regional Sales Manager for the Midwestern Region and joined our team in the Burr Ridge, IL, office last November. Rob comes to Zierick directly from Conxall in Chicago where he spent the last eleven years, most recently as Central Regional Sales Manager. In his position Rob is responsible for a 20-state region directing the efforts of manufacturer's representatives and two inside customer service specialists. Rob's energy and knowledge will be a tangible asset to our efforts in the midwest.

Al Bucci, our new Eastern Regional Sales Manager, came on board in July of 1998. His territory stretches from Canada to Florida and includes New England, New York, Pennsylvania, New Jersey, the middle Atlantic states, and the south-eastern states. Before joining Zierick, Al was a regional sales manager at Aerovox in New Bedford, MA. Al's experience comprises many sales areas: customer service, direct sales, sales representative, and sales management at regional and national levels. Al's vision and enthusiasm have already helped our sales efforts.

## Zierick Congratulates...

 John Norton, of Tektronix in Watsonville, OR, for winning the Big Bertha driver in our drawing held at NEPCON West last February.



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# Access the Zierick Reference Library

Please check literature you would like to receive.

- Catalog 36, Surface Mount & Through Hole Interconnection & Assembly Solutions
- Catalog 35, Interconnection Hardware *Just released!*
- Through Hole & Surface Mount Interconnection Capabilities
- Through Hole Assembly Solutions, Assembly equipment to Meet All Your Terminal Insertion Requirements
- Surface Mount Technology
- Video* Zierick Manufacturing Assembly Equipment
- Video* Model 9501 Operation and Maintenance
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I would like to receive Zierick newsletters and news releases via e-mail: \_\_\_Yes \_\_\_No

VOL. 2, ISSUE 3

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