

Engineering New SMT Pins

DC-to-DC power converters serve the same function as the transformer in AC-to-DC applications — they lower voltage from the transmission level to the proper distribution level. This basic function is required in literally thousands of applications throughout industry: from the military electronics in smart munitions to consumer telecom products — and in the manufacturing processes that make these myriad products. It is merely stating the obvious to say that the most critical performance factor in electronic assemblies, such as the power converters, is the electronic connection.

A primary challenge facing power supply manufacturers is to assure the reliability of the connections from board to board, board to device, and from the device to “the outside world.” Since power supplies may be subjected to extreme temperature swings —

e.g., from -65°C to 125°C in eight minutes, eight times in succession — achieving highly dependable connections is no mean achievement.

Making Stronger Connections

In new product designs, Zierick's SMT pins are frequently recommended when connecting PCB-to-PCB and PCB-to-assembly or device. One SMT pin developed by Zierick is a two-piece pin that uses capillary action of reflowing solder to enhance the connection in a number of ways:

1. A thinner layer of solder provides *higher retention force* in the solder joint. Since the function of solder is to maintain the connection, if the cushion of solder is too thick, it forms not only a weaker joint, but also results in an undesirable voltage drop. Additionally, the capillary tube that draws the solder also provides a way for gasses to escape. Enhancing outgassing results in fewer voids and, hence, fewer cracks which makes a stronger joint. Also, field evaluations show that posts with enhanced capillary action are more resistant to the effects of thermal cycling.
2. *Precise locational tolerances.* As the wicking action draws solder up into the pin, it also draws the pin to the pad.
3. *Ease of Inspection.* When properly soldered, Zierick's SMT pin has secondary solder fillets defined by the square pin and top of the pin base solder funnel.
4. *Automation.* Zierick also offers an intelligent loose-piece pin feeder which integrates into standard SMT flexible placement systems for full SMT automation.



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. We are continually updating and adding to the site to provide our customers with better service and the latest information about interconnection solutions — like our new Electronic Connectors Catalog. Check it out!

5. *Fixturing.* When a great number of pins are required on board stacking arrangements and parallel verticality is imperative, pin fixturing may be required. These SMT pins permit fixturing from the top of the pin rather than at the base — a process that avoids placing stress on the pins. Again, the result is less cracking and stronger joints.

Conclusion

To make reliable connections in ever more sophisticated devices, Zierick has developed SMT pins with automation in mind — to provide better connections (fewer voids), stronger connections (higher retention force), more accurate placement, and longer service life.

The Miniaturization of IDC's

Miniaturization is more than a trend in the electronics industry — it's a driving force! Zierick's SMT insulation displacement connector (IDC) terminal is a prime example. Zierick pioneered the SMT IDC with patented Torsion-Lok™ design, allowing this terminal to achieve wire connection and insulation shear in one motion, thereby eliminating the time and cost required for pre-stripping.

Where there is no insulation, as with an ultra thin 30 AWG magnet wire that has a thin ceramic coating instead, the Torsion-Lok™ IDC can terminate the connection without breaking the wire. Further, most IDCs feature rigid contact beams. The Torsion-Lok™ IDC does not — permitting a high degree of movement by the contacts which can even improve reliability over time.

Connection is achieved by simply pushing the wire into the high-deflection zero-clearance connection slot for a reliable gas-tight connection that withstands repeated mating cycles and harsh conditions. The Torsion-Lok™ design provides a predictable pre-loaded connection

force. Plus, built-in wire strain relief prevents wire motion from being transmitted to the contact interface.

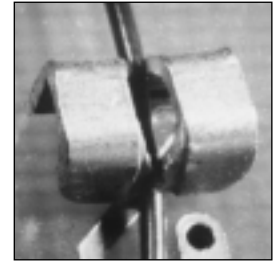
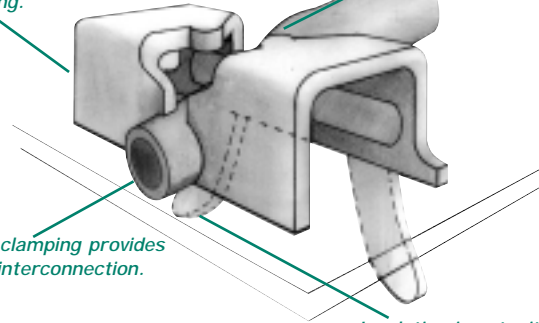
Zierick's award-winning Torsion-Lok™ IDCs are available in loose and reeled formats, for #30 through #14 AWG solid or stranded wire sizes.

Unlike rigid contact beam styles providing only one-time use. Torsion-Lok™ beams allow ample movement for repeated mating.

Built-in wire strain relief prevents wire motion from transmitting to contact interface.

Continuous clamping provides a gas-tight interconnection.

Insulation is cut with wire insertion, eliminating pre-stripping.



ASK THE EXPERT

Q: I need a custom stamped part tooled up, but have discovered that there are often big differences in tooling price from one company to another. Why?

A: To understand the differences in bids, ask yourself whether every vendor has quoted the same way. Short-run specialists offer tooling that generally costs less. For high speed, large volume, lifetime usage, however, you need to consider progressive die tooling with these attributes:

- Die sets have ball bearing pins and posts
- All stations are made with replaceable sections or inserts for infinite die life

- Idle stations are incorporated into the design for possible future modifications
- Trimming and blanking stations are made with carbide punches and bushings and bushings for low die maintenance & long life
- Bend stations are multiple qualified to hold angle tolerances.

There are other attributes that Zierick considers mandatory, such as guided stripper plates and flatness correctors. Every supplier has its specialty and Zierick, with a stamping heritage of more than 80 years, is expert in progressive die design and manufacture.

Ron Fredriks is a Senior Research and Development Engineer with Zierick. He came to us from IBM with twenty-five years' experience as an electronic packaging problem solver. In the past five years, he has helped develop our surface mount terminals and their automation. He is an expert in process development and in resolving plating problems.

Zierick Receives QS 9000 Certification

Approval gained on first audit.

The Quality Management System of Zierick Manufacturing Corporation, a leading provider of PCB connectors and assembly equipment, received a certificate of compliance with ISO 9001:1994 and QS 9000:1998 applicable to the design and manufacture of automotive and electronic connectors in its Mount Kisco facilities. The audit was made by ABS Quality Evaluations, Inc., of Houston, Texas. The Quality Management System of Zierick's Yatesboro, PA, plant also received ISO 9000:1994 certification. The effective date of certification was 9 November 2000 with an issue date of 6 December 2000. The Auditors reported that Zierick achieved approval on the first audit with "no elements with nonconformities either major or minor," stating that this was the first time they had recommended a new company registration on the first audit.



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Loose-Piece Pin Feeder Added to Surf-Shooter SMT™ Line

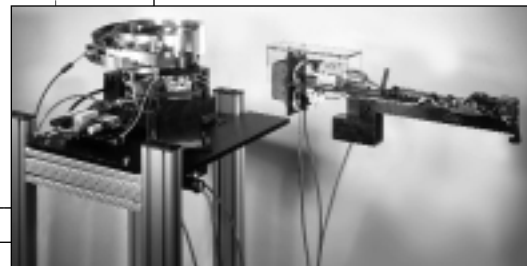
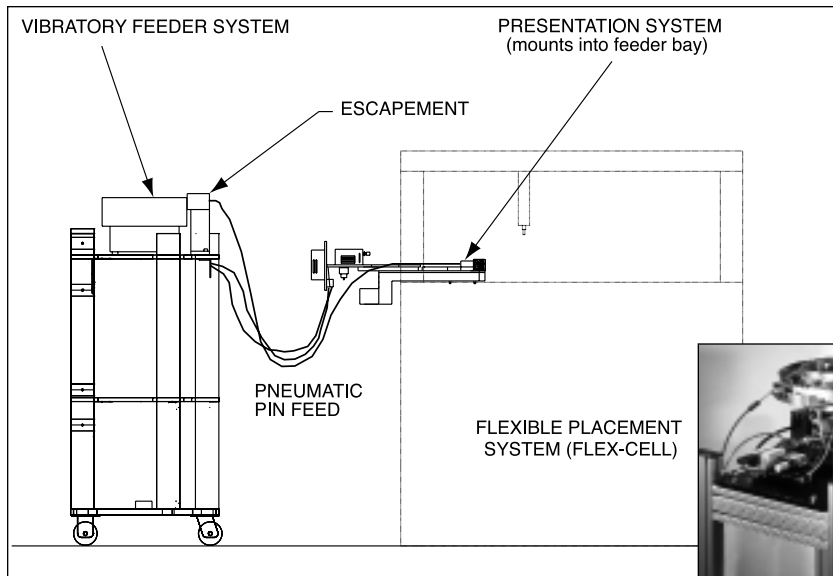
With SMT placement rates greater than 1 pin/second, our new loose piece pin feeder is the latest of Zierick's innovative solutions to SMT pin placement. Operation is simple. Parts are vibratory fed into an escape-ment where compressed air pushes each pin via pneumatic tubing into a mechanical shuttle that presents the pin to the placement system vacuum nozzle.

The unit is compact, less than 4" wide, and mounts to the placement system feeder bay of flexible placement (flex cell) systems. It has been successfully integrated into Siemens, Universal,

and Europlacer systems. The feeder itself is a self-contained unit, 110VAC/80psi, typically requiring no electronic control interface with the placement machine. A programmable

controller controls pin movement from the vibratory feeder system to the vacuum nozzle. The Surf-Shooter SMT™ can be easily installed and features minor tooling changeovers to feed different pin types.

Zierick's line of loose piece SMT pins range in size from 0.025" square to 0.080" in diameter and up to 0.75" in length. Pins are Brass with Tin/Lead over Copper plating or Gold over Nickel plating and employ the capillary action of reflowing solder to improve solder joint strength.



Product Line Upgrade

Zierick has upgraded its lockwasher terminal product line to include only Zierick's CDA 42500 Bronze parts and the military-standard version with heavy Tin/Copper plating. In consolidating this product line, Zierick is able to offer superior Phosphor Bronze parts at prices comparable to those of Brass parts. The Bronze lockwashers offer superior lockwasher retention properties. Each of these part numbers can be referenced in *Catalog 35* or on our website at www.zierick.com.

Interconnection & Assembly Solutions

New Catalog on the Web

Zierick has published its *Catalog 38 Surface Mount & Through Hole Interconnection & Assembly Solutions*. CAT 38 describes our comprehensive product line that includes a full range of surface mount connectors and feeder systems: Stable-Lok™ and standard quick disconnects, Accu-Lok™ and press-fit test point terminals, Accu-Pak™ and auto fuse receptacles,

Torsion-Lok™ IDC's, Accu-Post™ terminals, Snap-In™ and standard fuse clips, screw terminals, and assembly systems like our new loose piece pin feeder (see above).

CAT 38 contains schematic drawings with complete specifications, tolerances, and plating appendix along with ANSI/NEMA specifications and a part number cross reference table.

For convenient print outs, the entire CAT 38 is also available in PDF format.

Call us for your free copy or see it when you visit www.zierick.com.

Access The Zierick Reference Library

Please check literature you would like to receive

- Catalog 38, Surface Mount & Through Hole Interconnection & Assembly Solutions
- Catalog 35, Interconnection Hardware
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