

# Precision in Fine Pitch Stencil Printing

The Christian Koenen GmbH from Ottobrunn has successfully organised their first Technology Day after the Corona-related break and thereby demonstrated, how the high precision required in fine pitch stencil printing can be realised.

as well as poor paste release.

When welcoming the participants, Michael Brianda, Managing Director at Christian Koenen, expressed his joy that now such events are again possible with personal contact, and then viewed the market situation.

More and more complex circuits combined with a high mix of shapes and sizes as well as often thinner circuit boards require smaller printing and assembly tolerances. The process window is getting smaller. For reliable precision printing the choice of material and tools is given great significance. With step stencils the paste volume can be optimised. Coating the stencil improves the release behaviour and circuit board support during printing ensures for stability.

Michael Brianda

Michael Zahn

## **Circuit board support has great significance**

Based on the technology trends Michael Zahn, Global Business Development Manager of Christian Koenen, illustrated how the circuit board support ensures for the error-free stencil printing. With insufficient support, bending and movement of the circuit boards can cause, among other things, solder bridges and beads to form

Sebastian Bechmann

A large area rigid and solid support prevents this. He recommended a design with 3D software, because with that the component contours are followed, which ensures maximum support. Michael Zahn also presented a variety of application examples.

### **Milled step stencils are one solution**

After Sebastian Bechmann, Head of Application at Christian Koenen, had explained, what fine pitch components are as well as the associated challenges, he described, how one can optimise the fine pitch printing. In addition he showed examples of unevenness that disrupt the printing. Frequently this causes an offset of the substrate and mismatched pad sizes. Here milled

step stencils, a technique patented by CK, are often the solution.

### **Semi-additive technology for minute structures**

The future of the miniaturised circuit board and the possibilities of the semi-additive technology were shown by Stephan Dietrich, Senior Process Engineer of GS Swiss PCB AG.

Speakers and participants before the company tour

### **Interferometry for measuring the smallest spatial structures**

His company is specialised in the production of miniaturised flexible circuit boards e.g. for hearing aids. Here the trend is towards L/S of 10  $\mu\text{m}$  and below, which is where the conventional subtractive technique fails. He explained how such small structures can be realised with the semi-additive technology and also showed photos of the equipment used. At GS Swiss PCB the conductive layer required for the galvanic separation is applied by sputtering.

Axel Lindloff, Senior Process Specialist from Koh Young Europe, explained, how one can automatically measure the smallest solder depots.

A 3D measurement with Moiré interferometry is the industry standard.

Stephan Dietrich

Axel Lindloff

He described, how this basically functions and how the measurements can be made more robust with phase shift profilometry. The phase shift also enables a very good vertical resolution. The lateral resolution is also important, in particular with small structures. In addition shadow effects must be reduced, which is possible with multiple projectors. Axel Lindloff showed examples from different areas of application, whereby he focussed on the precision already achieved. The repeat accuracies are in the range of  $\pm 0.1$  %.

After the lunch break a tour of the company took place in small groups with subsequent networking in the Application Center. -gk-

[www.ck.de](http://www.ck.de)