

New advanced jet printer in ESCATEC Switzerland expands SMT capabilities

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As an EMS provider catering to major OEMs, ESCATEC believes in the importance of continually upgrading its technological capabilities to keep delivering high quality products and to accommodate customer requests for more advanced services. Within the Group, ESCATEC Switzerland (ECH) plays the role of an innovation hub and testbed, where new technology and processes are evaluated and, if found beneficial, will be rolled-out to ESCATEC's other production sites.

A recent example illustrates this 'technology roll-out' process, with ECH taking the lead for the wider Group. Based in Heerbrugg, Switzerland, ECH integrated a Mycronic MY700 jet printer to its Surface Mount Technology (SMT) line in early August 2023 and the results have been right on target. The advanced, cutting-edge jet printer offers many advantages over the stencil printing method usually employed for soldering in SMT production and has enabled ECH to improve the flexibility, efficiency, and quality, of its SMT output.

The SMT process is a foundational activity towards assembling most electronic products with a key part of it being soldering via stencil printing of various electronic components onto printed circuit boards (PCBs). Stencil printing involves using a stencil that is essentially a thin sheet with openings (apertures) corresponding to the locations where solder paste needs to be deposited on the PCB. The solder paste itself is typically a low-melting-point metal alloy that creates electrical and mechanical connections, enabling the components to be reliably 'joined' to the PCB. SMT's significance in electronics production lies in its ability to enable miniaturisation, reduce production costs, enhance quality and reliability, and adaptability to various PCB designs and component types.

ECH's new jet printer provides significant innovation over the stencil printing method, notes Production & Engineering Manager Dr Martin Mundlein. "It is a unique equipment allowing a very high level of flexibility for solder paste application, enabling up to 700,000 solder paste dots per hour and dispensing down to 200um size. By using it in combination with a stencil printer, it has given ECH full process flexibility when it comes to SMT," he explained.

The jet printer is currently installed directly in ECH's SMT line after a stencil printer and before a 3D solder paste inspection station. It has allowed ECH to reduce cost and lead times for prototype builds and low volume production by eliminating the need for stencils (which are expensive), while greatly expanding flexibility in the type and complexity of PCBs that can be run.

“We can use pure stencil printing for standard mass production, pure jet printing for NPI (new product introduction) and low volumes, and a combination of stencil and jet printing for mass production applications requiring topping-up with additional paste in critical areas, similar to the usage of a stepped stencil but with bigger freedom of application”, said Dr Mundlein.

Increased Flexibility, Cost Reduction, and Improved Quality

ECH’s new jet printer can apply solder paste to a far wider range of components, including those with complex geometries or that are in difficult-to-reach areas. This makes it ideal for NPI and low-volume production, as well as for high-volume production applications that require a high degree of flexibility.

“If a certain component like a shielding or a ‘Pin in Paste’ component requires more paste than other components, the possibilities with stencil printing are limited. Either over-printing or a stepped stencil needs to be done but both have significant restrictions and are expensive. The jet printer allows a very wide adjustment of the process as, for each pad, the applied solder paste volume can be adjusted individually. This adjustment can be directly done without delay, so the improvement loop is very fast,” explained Dr Mundlein.

The jet printer has reduced costs in several ways for ECH. Firstly, by eliminating the need for expensive stencils which have a long lead time when ordering and to set up. Secondly, there is an improvement in yield by reducing the risk of solder paste misprints and process failure, thirdly by allowing for precise control of the solder paste volume applied to each component, and fourthly by reducing the number of scrap or rejects.

ECH has also gained from higher standards of quality in relation to its SMT output because the jet printer improves the consistency of the solder paste deposits while reducing the risk of solder bridging and other defects. There is also an improvement in the overall appearance of the finished products.

Dr Mundlein believes the new jet printer is a valuable addition to ECH's manufacturing capabilities and, once it has been thoroughly evaluated and fine-tuned in ECH and with experience in hand, the technology is likely to be rolled out to ESCATEC’s network of production sites in Europe and Malaysia. Most importantly, ECH’s customers will benefit from the cost savings, shorter lead times, and higher quality, gained from the new jet printer.

Further enquiries or request for interviews / photos / comments, etc., can be directed to Mr. Rajeshpal Singh, Corporate Marketing & Communications Manager, at rajeshpal.singh@escatec.com, Tel: +604 6113 456.

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