

Economical at lowest lot size

Flowline Concept ensures boundless Flexibility in Soldering Technology

Loading the bare PCB in front and removing the finished product at the end of the production line – and this with short or even smaller production series with changing shapes and in different placement patterns. This long hoped for expectation in the SMT industry has become reality. Flowline is the name of this complete production line which has been developed in cooperation by the reflow soldering system supplier SMT Maschinen und Vertriebs GmbH, and Mydata AB. For the acceptance of the first production line to MOBA Mobile Automation AG, other customers had been invited to our Technology Centre in Wertheim – the response and interest was phenomenal.



Second from right: Mr. Thomas Bredin, Area Manager Market Support & Sales, company Mydata automation AB, Sweden

The change over of equipment to a new product model constitutes in every industrial segment an unappealing time and cost factor. Periods of line shut down and required labour slow down production and result in additional costs. In mass production this is less of a problem as the economics of extended machine runs compensate for the applied change-over expenses. Nevertheless, also in the electronic industry the production quantities are getting smaller, more custom made and are very often designed for specific applications. In order to realize a most economical production run for short and mini lot sizes, SMT and Mydata have fine tuned their production equipment and components to a unified “Flowline”. This approach offers the user in our industry an almost limitless flexibility.



Flowline concept Mydata - SMT

Change Over Time: Zero

The MY 500 Printer is the key to this newly acquired flexibility. Instead of the commonly used stencil, the printer is programmable and fixes single dots of solder paste on the carrier, similar to a jet printer. The printer is being loaded with bare PCBs from magazines; up to five of them with different formats can be supplied. Each PCB is marked with a bar code (or Data Matrix) which contains the printing code. After positioning a trial print is made, its accuracy being controlled by a camera. Subsequently, the original spray of the solder paste is released. The MY500 operates on the "Drop on Demand" principles, i.e. the print head moves over the object and is, by means of a Piezo crystal, activated to set a dot of solder paste at the pre-programmed location. The operating speed of the printer head is 500 dots per second, the grain size of the solder paste is 5 μ . The temperature controlled interior of the printer assures the optimal viscosity of the solder paste and achieves, therefore, a consistent quality of the soldering process. Change-over time, manual operation as well as cleaning and stencil storage are relegated to the past.

Automated Adjustment

After completion of the solder paste application the printer transfers the PCB to the placement machine MY 100 SX14. The track width of the transport unit is automatically adjusted to the width of the board. The placement unit identifies the approaching PCB and places the components as programmed on the solder paste. Downstream of the production line the soldering process takes place, in this case through the operation of a SMT Reflow Oven Quattro Peak S. At the interface of both machine manufacturers, the reflow oven is communicating with the other line components.

Being an important part of this contrived concept it is fully integrated in the production process. In addition, the customer benefits automatically from our approach to using lowest possible consumption of consumables. This means that we have not only drastically reduced energy consumption but have also realized for some time the use of an intelligent nitrogen control system. This nitrogen control system does not operate according to the commonly used principles of On/Off control, but the supply of nitrogen into the reflow oven is controlled proportionally to the required nitrogen. Accordingly, the inlet diameter is being reduced or extended and adjusted exactly to the requirement. This assures that the optimum quantity of nitrogen, so important for best soldering results, is always available. Numerous tests have provided us the ideal ratio of degree of purity to quantity regulation for achieving superior soldering results. The benefit for the user is a stable soldering process over an extended period of time. At the same time consumption is reduced to a minimum.



Meeting High Demands



*Left: Mr. Jan Tobias Fickus, production manager SMD, company MOBA Mobile Automation AG
right: Mr. Hans-Günter Ulzhöfer, CEO, company SMT Maschinen- und Vertriebs GmbH & Co. KG*

The first Flowline System, working under production conditions, has been installed at MOBA Mobile Automation AG in Limburg/Germany, an OEM for mobile applications for equipment manufacturers. The company supplies customer specific components and user friendly systems solutions with a focus on construction equipment and garbage and disposal logistic. Mr. Jan Tobias Fickus, responsible for component placement, rationalizes the need for the Flowline concept as follows: "We are a highly specialized sub-supplier for a very specific segment of the industry. 50% of our annual requirements for printed circuit boards are batches of less than 100 parts. Consequently, the flexibility offered by the Flowline concept is quite ideal for us. In addition, it enables us to produce sample boards in production quality, even in a lot quantity of

only one unit. It also puts us into the position to react immediately to occurring defects. For example, if a customer has an urgent requirement for exchanging a part, we can easily program and manufacture it. This means that even seldom needed parts do not have to be kept in stock. Another important point is that our complete production sequence can be centrally operated from our responsible planning department. At the production line itself, placement and discharge are the only functions left."

For MOBA, the decision to purchase the Flowline was based on the following key considerations: The Flowline approach does not just combines different machine components back-to-back but represents an integrated concept which can be centrally controlled. Extensive tests, beforehand carried out in Sweden, achieved convincing result and a Mydata jet printer at a Dutch company is in operation without issues for over two years.

Significant Cost Reduction

"The use of the Flowline is responsible for a distinct reduction in total production cost and improves simplification of our production cycle" according to Jan Tobias Fickus. "For our short run production as well as laboratory samples we do not require templates anymore. This has the added advantage that they do not have to be produced, cleaned and stored. The complete material handling is simplified and programming and documentation are uniformly and centrally managed. It does put us in the position to react fast and to the individual situation, and removes the need for storing of PCB's. The solder paste for the printer is only a little more expensive and the ejector has to be exchanged only due to wear at very reasonable intervals. Therefore, according to our calculations the advantages and cost savings are beneficial to us and our customers by a wide margin."



The intense interest in visiting our Technology Centre clearly indicates that the flexible and individual short-run production in the SMT area is consistently gaining in importance.

SMT Wertheim is a specialized supplier for thermal process equipment located in Wertheim. The range of products cover small systems for laboratory and testing applications to systems with multiple tracks for mass production. The company has at its disposal its own Technology Centre for training, testing and research capabilities.



Mydata Automation AB develops and markets pick- and place systems and stencil free printers for the electronic industry. The company was founded in 1984, is head quartered in Sweden and meanwhile highly recognized as an accomplished global supplier. The programmable printer is a recent addition to their production program but has already proven its production readiness after extensive testing in the past.

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