

Efficient Selective Soldering Systems cover all the needs of an EMS provider

## Successfully creating value through cooperation

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*Already for more than four decades, Zollner Elektronik AG stands for firm principles matched by traditional values. Not only are these mirrored in their know-how, their flexibility or their innovative solutions, but they are also prominently displayed in all the entrepreneurial actions of this successful service provider. In value creating unions with their customers and their suppliers, the expectations of all sides are fulfilled. One example of this is the partnership and close co-operation with ERSA GmbH in the area of selective soldering.*

Zollner, a service provider for electronic products, develops and produces individual parts, modules, complete devices as well as complex systems for the industrial branches of their customers. These come from different branches of the electronic industry - automotive, railway, office and data, industrial electronics, aviation, measurement, medical and telecommunication. With world-wide more than 8.000 employees, distributed over 16 production locations including the USA, this globally positioned corporation offers their services in the areas of product life cycle management, supply chain management, materials management and after sales service. Founded in 1965, the history of the corporation is characterized by its manageable organic growth at a stable revenue level. Qualified and highly motivated employees provide the necessary entrepreneurial action, holistic thinking as well as a continuous improvement of the processes. For the customers, this ensures a sustainable and high level of efficiency.

### Best-in-class Systems

One of the pillars for success is based on the selection of the right equipment to produce the electronic products. To be innovative and modern cannot be the only demands on the equipment! It also needs to fit 100% into the manufacturing environment, meeting the changing demands of customers. Therefore, the greatest care is being taken in equipment selection; each system considered is scrutinized in great detail before a purchase decision is made. Because of the permanently rising demands on the equipment and the processes, equipment suppliers are re-evaluated on a regular basis. In the field of selective soldering, the partner selected is ERSA GmbH. For more than 25 years now, the two companies have formed a competent and friendly partnership, during which time more than 40 soldering systems have been installed at Zollner.

In the field of electronics, Zollner offers the complete range from PCB assembly up to the

assembly of complete systems. At all times the company focuses on a continuously high and reproducible quality level, and on an effi-



The in- or off line selective soldering system EcoCell combines high throughput with excellent flexibility.



The first Versaflow 1 was purchased in 2000, the model 3/45 with four solder baths was installed a few weeks ago.

cient production process with the aim to continuously improve productivity. This was one of the causes to consider, in the year 2000, to introduce the selective soldering process. The manager of Electronic Technology (ET), Ulrich Niklas, recalls that moment in time 12 years ago: "For each evaluation, our focus has been on the technology. At that time, soldering in a nitrogen atmosphere was a very important concept for us. Because of the increased densities of the components on the board, the through-hole components were getting closer and closer to the SMT components, so that the N<sub>2</sub> process was required. Additional demands were for a safe process of handling temperature sensitive components in conjunction with a precise and fast production process. After having analyzed all the facts, our decision was made in favor the ERSA Versaflow." Last but not least, this equipment manufacturer was known

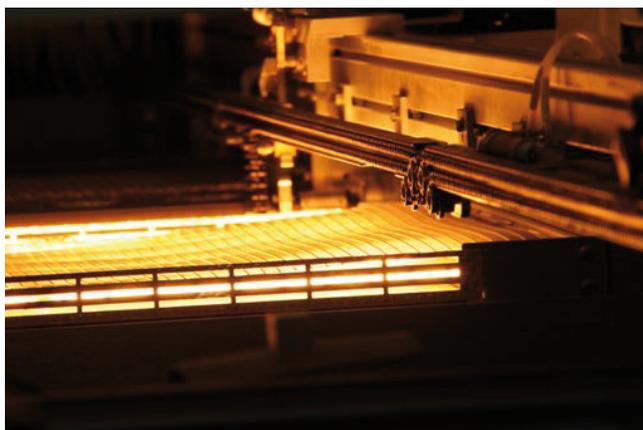
to the corporation since 1985, the year the first soldering system was delivered. Niklas adds: "Because of the broad product range of an EMS company, the demands placed on its partners are multifaceted.

But since ERSA, with its program of continuous product and process improvement followed the changing technology, we could further our development together. In my opinion, this supplier is both technology as well as market leader in selective soldering". Today, there are two Versaflow installed in the Zandt facility, one each in Altenmark and in their US facility.

## Economical Selective Soldering

The Versaflow finds its application in in-line selective soldering for large series production, where it excels through the dual conveyor system. The newest model of the Versaflow, installed at Zollner only a few weeks ago, is equipped with 4 individual solder baths and 8 spray fluxing heads, all working simultaneously and therefore provides the required high throughput. Due to its modular design, it commands a small footprint, and additional solder bath, fluxer and preheat modules can be retrofitted in the future if the throughput requirements increase. The system could equally be down sized through the removal of modules if called for. Preheat modules, thereby changing the system length, can be adapted to the process requirements of the board assembly to be processed, so that an optimal utilization while retaining maximum flexibility is ensured. A hybrid preheater assists and simplifies the preheating of assemblies with high mass, while the improved accessibility to the system from the front eases the task of maintaining the unit. While the focus for the first Versaflow purchased was on throughput, this has changed, and for the recently installed Versaflow 3/45 it was important that lead free as well as leaded alloys and boards of up to 500 mm width were able to be processed. ERSA's key account manager, Radek Lauer, added: "On our systems we offer a large number of options, so as to modularize and exactly match the system to the requirements of our customers. Features, which were initially developed with and for customers such as Zollner, are later integrated to become standard features or standard options, available to all customers. Through this closeness to our customers, we always are aware of what is needed to remain a supplier positioned at the leading edge of technology." Also installed in the electronic production facility managed by Ulrich Niklas is one of the Ecocell selective sol-

dering systems. This type of system functions along the Toyota-principle, moving the printed circuit in a counter-clock wise direction, which makes it an ideal unit for installation either in a production island or for side-line operation. At Zollner, the system is configured for operation in a production island, while maintaining it high level of flexibility. With two integrated preheaters, up to 4 PCB's can be processed simultaneously – the dual pot systems process the boards with a high level of efficiency. Set-up and maintenance costs are minimized, since one of the two multiwave solder baths can be maintained while the other bath continues to operate. The integrated flux spray control feature of the precision spray fluxer ensures a flux deposition, as either single point or a track, with reproducible high quality. The short-wave IR preheaters, mounted below the boards, can optionally be augmented by top-side convection preheaters. An additional optional top-side convection preheater mounted over the mini-wave solder bath ensures that the board temperature is maintained during the soldering cycle. The peel-off function of the solder nozzle opens up the possibility to solder without the incidence of bridging when soldering at 0°. This is an extremely valuable feature, ensuring a process with a minimum DPM level. The operating software of the unit, which stores all relevant production parameters in compliance with the ZVEI standard, distinguishes itself through its intuitive programming. The ability to store the production parameters was a very important request posed by Zollner, since as an EMS provider without its own products, the concept of traceability possessed a very high degree of importance. But that is not all, as Ulrich Niklas explained: "Through the standardizations via the ZVEI interface, we could visualize the process, thereby making it transparent for our customers". This feature has now been integrated into all systems, re-enforcing the trust of the customers. The graphical programming interface allows for quick and easy offline programming while the production is in process, thus providing a high level of equipment availability for production.



With the two integrated preheaters of the Ecocell, up to 4 printed circuit boards can be processed simultaneously

## Solutions for Production Islands

Since the demands on the equipment had changed, a new evaluation of the selective soldering process was required during 2004. Now the focus lay on the use of lead-free as well as leaded alloys, an improved cycle time through synchronous soldering with 2 solder nozzles (dual soldering), the possibility to configure the system with each 1 multi wave bath and one single mini wave, and the ability to be integrated into a production island. Considering these demands, the choice was clearly the Ecoselect 350 from ERSA, of which there are presently about 20 units installed at Zollner. Michael Schwarz from the electronic production technology group has long come to appreciate the advantage of the units: "The Ecoselect can handle leaded as well as lead-free solders, and it offers us in the production islands where they are installed maximum flexibility with little to no time losses due to retooling. We can process in parallel two board assemblies, thus realizing a substantial gain in throughput". A virtually perfect solution, considering that due to numerous exemptions in the legislation the customers still order products which need to be soldered with leaded as well as lead-free alloys. Here also the cooperative teamwork of both corporations bore fruit – from the demands of Zollner's Lean Manufacturing strategy of manufacturing in production islands in combination with the concurrent use of two different alloys, an Ecoselect model was configured to exactly fit the service provider's needs: A compact selective soldering system with dual soldering nozzles for high throughput, a dual pot for leaded as well as lead-free solders, a dip module and a large portal with a usable working area of 350 mm x 400 mm, and finally an encompassing acquisition of process parameters via a tracing system. That feature level that has been extended into all units of the Ecoselect 350 manufactured by ERSA. This is a powerful proof, that a close contact, when accompanied by technology transfer, between two separate companies can further the general development of equipment and processes, and that all participants, be it the equipment supplier or the user and other, future customers, can benefit from this.

[www.ersa.com](http://www.ersa.com);  
[www.zollner.de](http://www.zollner.de);  
[www.epp-online.eu/home](http://www.epp-online.eu/home)