



In Search of Challenges

*The solder wave height test for a perfect solder wave.*

## EMS Provider Kraus Hardware invests in Ersa Selective Soldering Technology

A comprehensive range of services along the full chain of production, high quality, profound process knowledge and high delivery reliability – in short, EMS in tune with the times, this is

what distinguishes Kraus Hardware in Großostheim. Customer requests of all kinds are quickly and creatively implemented by a team of highly motivated and skilled, qualified employees.

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published in  
EPP 11/2015  
in Germany



Assemblies for selective soldering with up to 406 x 508 mm – no problem for the small sister of the VERSAFLOW.

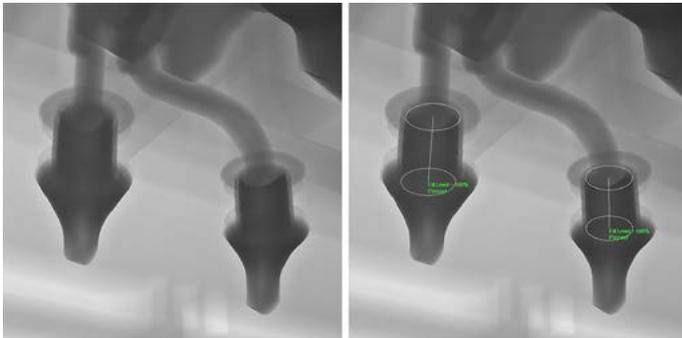
The more than 80 national and international customers of Kraus Hardware come predominantly from industrial areas where demanding soldering applications are prevalent, such as, for example, aerospace or automotive. From handling complete projects, including the production of the board assemblies that had been developed, right up to customers which are interested only in certain services such as rework, X-ray or testing - regardless of what the customer requests, each request is being handled with full focus being placed on service and quality.

"We don't shy away from challenges, on the contrary, we are looking for them", emphasizes Andreas Kraus, the managing director. Being handed difficult soldering tasks, "unsolvable" jobs, applications considered not solderable or other unusual projects are to the liking of the Kraus team. They will right away and with great intensity start to look for the optimal solutions to overcome the problems. And since each employee is a highly qualified specialist, who knows the individual process steps as well as the complete soldering process, the team usually comes up with an innovative solution. The team is made up from three hardware developers, a certified IPC trainer (CIT) and 12 certified IPC specialists (CIS), which

have, by the way, all undergone the obligatory ESD training. This structure offers many advantages to Kraus. First of all, all specialists can be flexibly utilized in different areas of the production environment, and secondly, it is the prerequisite for the very high quality standard that is being maintained at Kraus Hardware. On account of his extensive personal process knowledge, each employee is in the position to judge at any time during the manufacturing cycle the quality of the product produced, and he will therefore recognize potential problems at an early stage.

Whoever aspires to be a step ahead of the times with his products and services offered, needs not only be knowledgeable of current process technologies, but also requires a keen sense to detect the direction the technology will follow over the next years. It is part of the business principle at Kraus not to shy away from investments, but rather to invest on a regular basis in state-of-the-art equipment and systems. For Andreas Kraus, the chief executive of Kraus Hardware, a proactive attitude of the entrepreneur is the key for success. Investments which are not forced on to the manufacturer by a bottleneck in production or by needing to replace an existing but defective or outdated system, not only have the ad-

*A little of everything: the test board used for the evaluation of the selective soldering systems.*



*Playing it safe – the capillary rise on through-hole solder joints can be reliably verified with X-ray inspection.*

vantage that there is no deadline for the purchase, but also that a comprehensive evaluation process can be adhered to. And being aware of one's own technical requirements and demands is an important starting point for making the right purchase decision.

For many years now it is being proclaimed that through-hole technology components are being designed out, yet, the reality found on the production floor of many electronic manufacturers, does not support this claim. On the contrary, the demands on the quality of the assemblies populated with through-hole components, particularly products for the automotive, but also for the aerospace and the medical industry, have continuously increased. The introduction of new components and circuits, the large increase in package density as well as the ever

increasing differences in the mass of the components installed, have, over the last few years, further raised the demands placed on selective soldering systems. And the current demand for uninterrupted and complete traceability has made the selective soldering process - where the process steps are completely reproducible - even more attractive when compared to all other soldering processes. For these reasons it was for Andreas Kraus, the founder of the company, only another step in the consequent expansion of his high quality standards, when he decided to invest in a selective soldering system.

After undertaking a market survey investigating the current state of the technology, looking also at the future trends for selective soldering, a selective soldering test board was developed. Starting with the known challenges of today and the perceived challenges of the future, everything which might constitute a problem for the new system was integrated in compact form on the test board. These boards were then used to evaluate the systems of the potential suppliers, comparing the results of the trials. Based on the type of products to be manufactured by his company, that is small to medium volumes as well as prototypes, Kraus concentrated his attention on finding a system that would operate efficiently and economically when processing small batches.

Strong emphasis was placed on, aside from the actual soldering results, the impressions gleaned from the suppliers during the test soldering, on the user friendliness of the software as well as the system itself. Another important selection criterion was for Kraus the service team of the potential supplier. Particularly when the products to be soldered may be bordering on the "not solderable", a superior service from the supplier and fast access to his application- and development engineers was deemed to be important, a point, which can prove to be crucial for the successful operation of the customer.

Finally a decision was made for the purchase of the ECOSELECT 1 selective soldering system from Ersa. Paramount

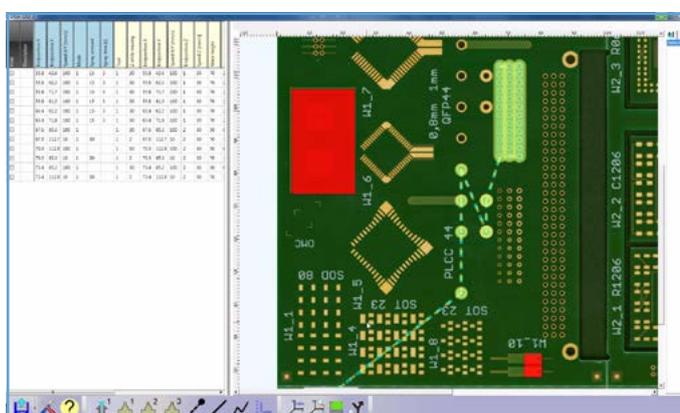
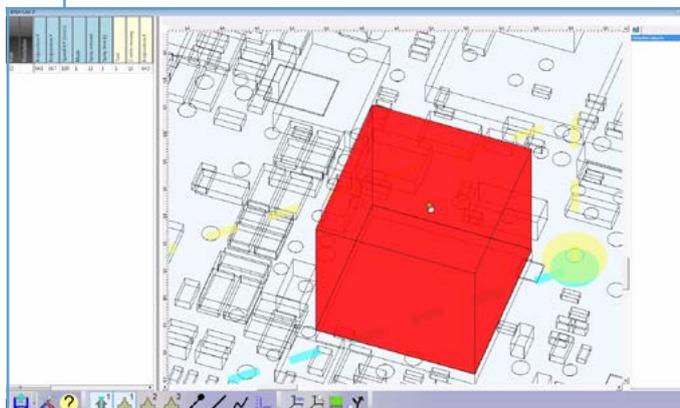
for this decision was for Andreas Kraus not only the quality and availability of the Ersa service, but also the fact that, with the compact ECOSELECT 1, the superior technology of the Ersa inline systems had not to be foregone.

Just as in the large VERSAFLOW systems, the maintenance free electromagnetic pump was installed in the solder bath, and the heating and fluxing was also the same as in the inline VERSAFLOW. This offers the advantage that the soldering results reached with the ECOSELECT 1 can, at a later time, easily be duplicated on an inline system for volume production. And another benefit of the ECOSELECT 1, being a compact system, is the fact that even when processing small volumes of assemblies with its attendant short production cycles, it does so very economically and highly efficient. The small solder volume of the two solder bath can be heated up to operating temperatures very quickly and energy efficiently, differing from large systems which are not laid out for small production volumes.

A system that is manually loaded has obviously a reduced throughput rate when compared to an automatic inline system, yet this is, for Kraus, not an important criterion at this time, as their volumes, unlike in a high volume production environment, are generally small. But one feature of the ECOSELECT 1, the Mini-Vario Wave, Kraus Hardware did not want to do without. This especially for single bath applications developed wave solder nozzle, which can be installed in place of a single nozzle or in combination with it in a second bath, allows to simultaneously wave solder numerous pins on an assembly, such as for example connectors. This not only drastically reduces the cycle time of the assemblies processed, but also increases the flexibility by offering a wave soldering process without investing in a separate wave soldering system.

In the decision making process by the Kraus team, importance was also placed on the CAD Assistant 3, with which offline generation of complete programs is possible. Based on CAD data or on scans of the printed circuit board, the technicians can program the points or

*User-friendly software - 3D-images for intuitive programming and for optical control.*



*Intuitive generation of solder programs through the graphic and tabular user interface.*



*Selective soldering system Ersa ECOSELECT 1 – Small footprint featuring impressive technology*

Highly impressed by  
the ECOSELECT 1 -  
General Partner Elke Kraus,  
Production Manager Stefan Winter  
and Ersa Area Sales Manager  
Ulrich Dosch.



tracks to be fluxed as well as those to be soldered. The offline generated solder program can be transferred directly into the system controller and used immediately for production.

Downtime due to equipment setup is therefore substantially reduced, and particularly in production environments where products are frequently changed (small batch, prototyping), the variety of programs required can be easily generated and/or modified without causing equipment downtime. Another essential feature speaking for Ersa was the availability of a lower and an upper preheater. The full-area lower heater installed in the ECOSELECT 1 gently preheats the assembly using IR technology. It can be segmented for smaller PCB's or for those instances where less heat is required. The system also features a topside convection preheater, an option, which is not available from many suppliers of systems in the compact range. Yet it is a tool that finally ensures the homogeneity of the heat distribution within the assembly. It is especially of importance when high quality solder joints on large thermal masses are called for.

With conventionally leaded components, an x-ray examination to qualify the process and to monitor the capillary rise of the solder and the formation of the solder joint is an essential

part of the process. Here as well, Kraus Hardware offers its customers a comprehensive service. Assemblies can be screened at any time with their modern X-ray system, to ensure the adequate filling of the through-holes.

Generally speaking, at Kraus Hardware the major focus is placed on quality and quality control. Strictly adhered to quality control is not only an important component of the services offered, but it is an integral part of all corporate processes. Each product manufactured can be fully traced, starting with receiving right up to each step in the production. The ECOSELECT 1 assists this tracing by supplying the traceability data as per the SAE/ZVEI standard. All traceability reports are complemented by a date stamp and by user identification. The data is recorded in a XML-protocol and can be called up by a higher level MES system. Needless to say, the new selective soldering system fits seamlessly into the quality concept of the corporation.

With the investment in the ECOSELECT 1, Kraus Hardware complemented its already impressive range of services to its customers. It is an investment into the future of the company, with which further advantages vis-à-vis its competitors on the highly competitive EMS market can be gained and ensured. ■

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