



Pilot project: Variosystems & Ersa

*Variosystems site at Steinach
near Lake Constance.*

Ready for take-off – with oversized boards for aviation!

Most of the customers of EMS service provider Variosystems AG from Steinach on the Swiss bank of Lake Constance are from industry, medical technology, aviation or railway technology. Founded in 1993, the Swiss company has been constantly growing ever since and currently

has 1,470 employees – some of whom are based at sites in Sri Lanka, USA and China. With the Ersa selective soldering line VERSAFLOW 3/66 for processing oversized boards, Variosystems now has a real unique selling point: it is the first Ersa machine of this type in Switzerland!

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To deal with the enormous cost pressure in the hard-fought market for EMS service providers, Variosystems relies on absolute customer orientation and focuses on customer service in particular. "We want to implement what our customers need – in future too. It is important to be familiar with our customers' processes and product cycles, and we are," says Norbert Bachstein, Managing Director of Variosystems AG. It goes without saying that this includes flexibility and quality as well. "Just considering the product price is not a long-lasting strategy. In a high-price country like Switzerland our solutions have to be more intelligent and cleverer than others. That is the challenge we face," Bachstein continues. Variosystems drafts electronic and software solutions for its customers, develops complete products and takes the products from being prototypes including tests through to readiness for series production, takes over procurement processes, production and logistics – looking beyond the manufacturing process itself to the overall picture is natural here.

Another fixed part of the Variosystems range is a continuous service package – from development and production through delivery to the "end of life". This results in optimum processes throughout the development and production chain. "For the best possible cost optimisation we have to bring together and supplement our customers' know-how and our own as early as possible. It is quicker and less expensive for us to develop exactly what the customer actually wants. The earlier a customer involves us in the project, the better the processes can be coordinated and optimised," Norbert Bachstein explains.

VARIOSYSTEMS: ALWAYS CLOSE TO THE PRODUCT CYCLE

The professed philosophy at Variosystems is to remain "close" to the complete product cycle "at all times": the products are constantly being checked and optimised proactively – whether this concerns the production process or the product itself. In agreement with the customer, individual components within the assembly are exchanged as soon

From left to right: Meinrad Eckert (Ersa Area Sales Manager), Valentin Egger (Head of Global Procurement, Production Manager Switzerland, Variosystems AG), Bujar Latifi (machine operator, Variosystems AG), Ruedi Ryser (Delsys AG, agency for Ersa machines in Switzerland).



as a better solution hits the market. If a component is discontinued by the manufacturer, Variosystems also reacts immediately and makes sure of stocks or a replacement product following consultation with the customer. In such a case, the customer no longer has anything to do with material procurement, production and testing.

Variosystems delivers the entire support beyond the respective product lifetime. Another important module in the company strategy is continuous investment in the four sites. All four have identical equipment and the same processes available. This allows 90 percent of the products to be relocated quickly and easily. A remarkably efficient basis that enables Variosystems to react quickly and dynamically. In such cases, the following question always has to be asked and answered: Which is the best production location for the product from an economical and technical point of view? If a customer is based in south-east Asia, for example, it might be more sensible to manufacture his products in Sri Lanka since this will cut response times and transport times.

POWER ELECTRONICS WITH 590 X 490 MM

Alongside the general trend in the elec-

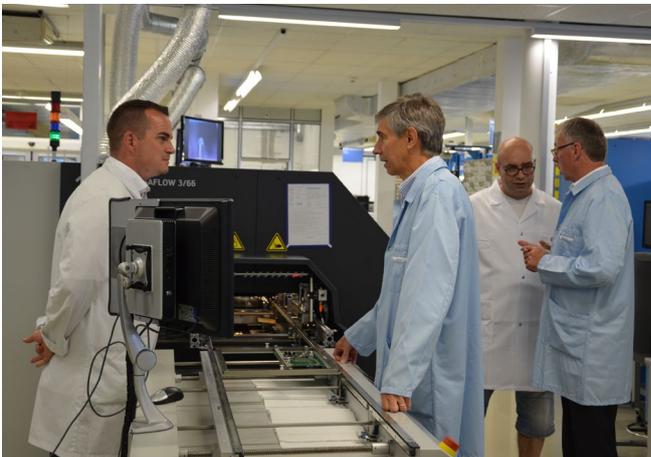
Infobox

Variosystems

- Employees worldwide**
1,470
- Production area**
46,000 m² in total
- Number of assemblies produced**
4 million per year
- Number of different assemblies**
> 3,000
- Market sectors**
Medical, aviation and aerospace, industry, rail technology, security technology, renewable energies, automotive industry



Existing wave soldering line ERSA N-WAVE 330 at the Variosystems Steinach site near Lake Constance.



Variosystems employees and representatives from Ersa in direct contact at the Ersa VERSAFLOW 3/66.

tronics industry towards smaller and more compact assemblies, the PCBs in power electronics are becoming larger and thicker – wherever the corresponding conditions are given. Large ground wire connections are used here which require a lot of thermal output.

Variosystems already has customers from the aviation industry who require such assemblies, and is recording a growing demand in this segment in particular. End products include special helicopter drives, for example, or aircraft communication modules. The dimensions of such assemblies are 590 x 490 mm. Even the Variosystems team with its existing Ersa selective system 40/50 reached its limits here. So how to solve the problem?

It was decided to relocate the selective soldering line VERSAFLOW 40/50 to Sri Lanka, this filling in the equipment gap that had been at the site up to that point. The VERSAFLOW 40/50 fits in with the product portfolio there very well, where only lead-free solders are processed and mainly large product series are manufactured.

STEINACH SITE: EXPANSION INTO A TECHNOLOGY CENTRE

In contrast, the Swiss Variosystems plant in Steinach was to be further expanded into a development and technology centre. The matter of buying a new selective soldering line was tackled. On the technology side, Variosystems attached great importance to a maximum working range and flexibility. "In Switzerland we need manufacturing solutions that allow us to remain flexible, because we don't have the large quantities or enormous set-ups here. We sometimes retool six or seven times a day," says Valentin Egger, Head of Global Procurement and Production Manager. Besides, the machine would not only be processing oversized or heavy boards with power electronics, it could also be used for standard applications with board dimensions up to 450 x 400 mm. In addition, Variosystems also uses up to 20 percent leaded alloys alongside lead-free soldering for certain applications from the medical field, for example.

Following the evaluation process with extensive solder tests at the Ersa Applications Center, the decision was taken in favour of a machine of the type VERSAFLOW 3/66. Ersa designed the line with variable top and bottom heating and two solder modules with a dual-pot system for mixed production. Compared with the existing VERSAFLOW 40/50 with only one soldering module with changeover pot, the VERSAFLOW 3/66 now has four pots available at once – Variosystems operates three with lead-free and one with leaded solder. This significantly increases productivity, retooling times of between three and four hours a week that used to be necessary for converting the previous 1-pot machine from leaded to lead-free applications are now a thing

of the past. Alongside different solder alloys, it goes without saying that different nozzle diameters can also be used at the same time in the machine with four solder pots, which has a further positive effect on the processing time. One concrete example: For connector strips, a solder nozzle with a large diameter is used first. Then nozzle two is used with an appropriate diameter for the smaller individual solder spots.

In tight spots or for very small solder spots, nozzle three with a slim nozzle geometry is used. This means the PCB progresses once through the machine, all the jobs are done one after the other and the selective soldering process is completed after one passage. No conversion to new nozzle diameters, less thermal stress for the assembly, safe solder connections. Thanks to the flexibility in nozzle selection, preliminary work such as masking the bore holes which have to remain open after soldering is no longer necessary for Variosystems. "The process has become more cost-effective. We no longer have any rework caused by removing masking now," Valentin Egger reports.

"Then there are the many minor details such as improved tin supply, automatic detection of whether the right tin roll is inserted, or automatic nozzle cleaning which all lead to improvements in the process. These are the details that are extremely important to us."

UPWARD-COMPATIBLE SOLDERING PROGRAMS

"And a lot has happened in terms of program creation, too," Ersa Sales Manager Meinrad Eckert adds. Thanks to the 3D CAD Assistant, even complex soldering programs can be prepared quickly and easily on the basis of DXF or STEP files. The program editor also processes images of scanned PCBs and is set up according to the machine configuration. All movements of the fluxer or solder pot axis systems are entered graphically on the PCB picture and are provided with process data.

The auto-routing function calculates the best possible travel routes, optimising

cycle time. In addition, blocked areas can be defined to avoid collisions. The programmed data generated can be ideally checked through the 3D visualisation and can be used immediately in the selective soldering machine. The entire program creation process takes place offline while the machine continues production. An important factor in the Variosystems decision in favour of VERSAFLOW 3/66 was the fact that the solder programs of the Ersa systems are upward-compatible. In other words, Variosystems can copy all existing programs for the VERSAFLOW 40/50 to the 3/66 and use them directly without having to re-program everything – which would be no mean feat considering the 2,500 different products being made. This way, there was no break following the change to the new selective soldering line.

"Since we are a high-price country, we have to be a bit cleverer and have the machines under control better. And communicate more with the manufacturer if we stumble across a problem that we cannot solve on our own. This is why short paths and fast response times are so important to us. And these are always guaranteed by Ersa," Valentin Egger explains. Ersa has a unique sales and service network with seven application centres, ten sales and service branches and more than 70 agencies with their own service teams and spare parts warehouses all over the world. In Switzerland, this is Delsys AG managed by Ruedi Ryser, who has been part of the Ersa team for more than 25 years.

Norbert Bachstein and Valentin Egger are in agreement: "The Ersa VERSAFLOW 3/66 delivers what we were looking for. We are perfectly equipped for the future and have an absolute unique selling point in Switzerland with the VERSAFLOW 3/66 for processing power electronics and large boards. The VERSAFLOW 3/66 produces reliably in high quality, production processes and cycle times have been considerably optimised. And last but not least, employees are highly motivated, enjoy using the line and are always thinking about how they can get even more out of it." It's quite possible that the business partners Variosystems and Ersa will get together to look for and find new solutions in future again ... ■

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