Ersa Selective Soldering Systems
In a class of its own!

kurtz ersa

Cost Saving through these technical highlights:

- Highest flexibility
- Superior quality
- Highest Energy Efficiency
- Highest equipment availability / uptime
- Easy to maintain and service
- Highest through put
- High level of process safety / reliability
- Easy programming
- Ready for traceability

VERSAFLOW 3
3rd generation of the leading selective soldering system for highest demands on throughput and flexibility

ECOCELL
in-line and off-line selective soldering system, ideal for manufacturing in cells

Ersa Selective Soldering Systems
In a class of its own!

Leading edge technology and modular design match the highest demands on flexibility and throughput while fitting in virtually every budget.

Competition within the electronic manufacturing industry has very much intensified over the last few years. Enormous cost pressures, while at the same time demands on quality and shorter deliveries increased, have forced OEM and EMS companies to rethink their production processes. Permanent optimization of the manufacturing processes and the need to expand the technological and economic advantages are, on a daily basis, presenting enormous challenges to industry. Regardless of whether maximum flexibility or a high throughput or both is being demanded, Ersa, with its line of selective soldering systems VERSAFLOW, ECOCELL and ECOSELECT, offers optimal solutions to all these requirements.

The modularly designed, top-of-the-line VERSAFLOW meets even the highest demands on flexibility and throughput. It's virtually unlimited configurability opens the door to fully satisfy any potential users' needs. With the possibility to extend the system by additional modules, the VERSAFLOW 3 can grow to accommodate a customer's needs, safeguarding the future. Responding to the need of those customers that plan to use a cell type system, the ECOCELL selective soldering system has been designed to be specifically integrated into a production island. In this model, the solder process is executed counterclockwise in a u-shaped layout. As in the VERSAFLOW 3 - and in order to assure the essential high through put - there are, for each process step, individual aggregates available. The ECOSELECT soldering system is the optimal solution for small to medium volume production needs. With the option to operate the system in-line or off-line, the ECOSELECT excels in versatility.

Over the last 15 years, Ersa has placed more than 1000 systems in the field, and with each additional system sold, Ersa has strengthened its position as the market and technology leader in the automated selective soldering process. Ersa's technological advantages optimize the quality, the cost and the on-time-delivery service of our customer's manufacturing process.

ECOSELECT 1
the perfect start-up solution for efficient and reproducible soldering processes in small-scale and customized production

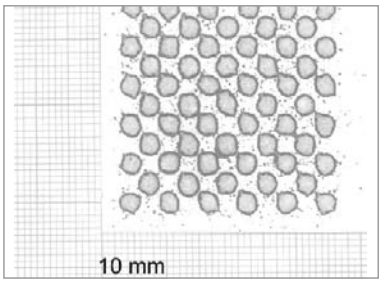
ECOSELECT 2
for your modular manufacturing concept with optimal price/performance ratio

Fluxing with the Highest Precision

Superior process safety and positioning accuracy even when in high throughput operation

Multidrop precision fluxer Superior process safety through flux volume metering

Dual tank flux supply



Flux–Spray pattern; Multidrop precision fluxer warrants minimum ionic contamination for highest quality

All Ersa selective soldering systems come with a programmable precision spray fluxer to evenly apply the flux. Application patterns are either as points or as tracks. The automatic spray stream monitoring feature and the flux volume metering option provide a maximum in reliability. The spray head offers an absolutely precise and well defined flux deposition on even the smallest areas. The flux is targeted to be applied only to the solder joint to be made, whereby the wettable area can be as small as 3 mm. Thus, no more flux than is required to form the solder joint is applied, with the effect that ionic contamination of the board is minimized and flux consumption is reduced, saving cost.

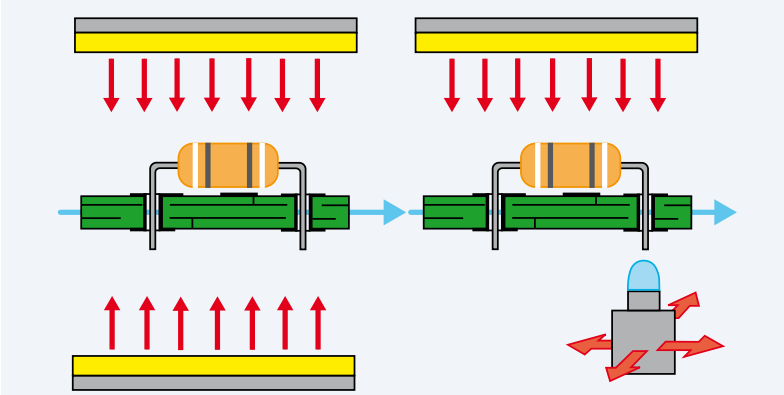
For those applications where two different fluxes need to be used, a second flux tank and spray head can be installed in the system. Selecting the flux to be used, is fully automated and defined through the solder program. Alternatively, a second flux head can be installed, which will allow simultaneous processing of multi-up panels, where both spray heads deliver the same flux type. This option will double the throughput of the system.

In the VERSAFLOW 3, up to 4 spray heads can be controlled. Through an innovative function, the high performance controller of the system enables the flux heads to precisely wet large areas. Without time consuming stops of the fluxer axis, all the heads installed are continuously in movement, each being activated at exactly its programmed position. Supported by the Ersa CAD assistant, the fluxer is exceedingly facile to program. For fluxes with particularly high solid content, Ersa offers an ultrasonic spray fluxer.

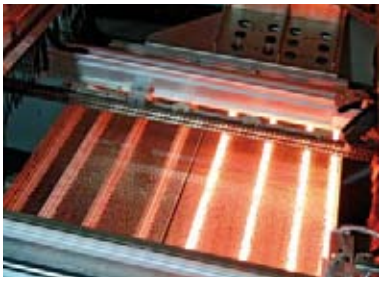
Perfect Preheating

Reproducible and economical – lower and upper preheats ideally combined

Ersa preheat concept a perfect combination of dynamic lower and upper venturi induced convection preheater for reproducible results



Short wave IR emitters below the board and upper convection preheater



Lower preheater emitters switchable in groups

segmented short wave emitter cassette

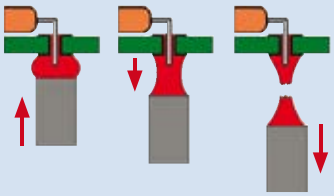
fully formed fillets on 24 layers board

Today's selective soldering processes, in particular those for lead-free soldering, multi-layer boards or high frequency applications, call for increased preheat capacities. Sufficient activation of the flux applied is essential for optimized wetting, so that on densely packed multi-layer assemblies good capillary, and therefore a fully formed top side fillet, can be achieved.

The heating profile of the lower heater assembly has been considerably improved by a change in the layout and a larger protrusion of the emitters. The completely redesigned top side heaters of the Ersa selective soldering systems are perfectly tuned to the lower heaters, so that a very effective and reproducible heat distribution and complete soak of complex assemblies is assured. The convection of the top side preheaters, used to transfer the energy to the board, is generated through the venturi effect, and it provides for an even temperature distribution over the complete board, while at the same time limiting the use of power and minimizing the weight and the size of the module. This dynamic upper preheater is capable to transfer the optimal amount of energy to even large assemblies with numerous inner layers and large and heavy components.

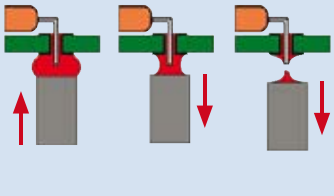
For assemblies of small physical size, the heater modules can be split in two segments, so that two separate boards can be preheated simultaneously, shortening the cycle time. By adding top side preheaters also over the solder modules, the temperature of the assembly can be maintained at the correct temperature. Any cooling off of the board is eliminated, even if the solder cycle time should be relatively long.

Soldering with Unique Energy Transfer and Precision



Improved exit from the wave through peel-off function

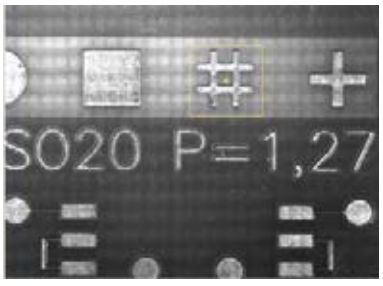
B: slim fillet



Exit from the wave without peel off

A: fat fillet

Automatic control of solder wave height



Fiducial recognition – Extract from ERSASOFT

The solder module with its induction pump warrants absolute control of the solder process quality and minimizes energy use and nitrogen consumption.

Regardless of which Ersa selective soldering system a user may select, he never has to accept a compromise in the soldering technology. The manually loaded ECOSELECT 1, the ECOCELL and the highly flexible VERSAFLOW – all these systems are provided with an electromagnetic pumping system. Since there are no moving mechanical parts in this pumping system, only minute amounts of dross and dust are being formed, which drastically reduces the amount of maintenance required on the solder bath. The pump warrants an extremely constant flow rate, which translates into an exact and finely tuneable stable solder wave height. All dynamic process parameters, such as solder level, solder wave height and solder temperature are continuously monitored and documented.

Ersa selective soldering systems warrant perfectly formed solder joints every time. They can be reproduced! And with the innovative peel-off function provided, systems with the electro magnetic pumps move into the direction of "Zero-Defect Soldering". With the peel-off feature, bridging is not an issue, even when soldering on a horizontal conveyor.

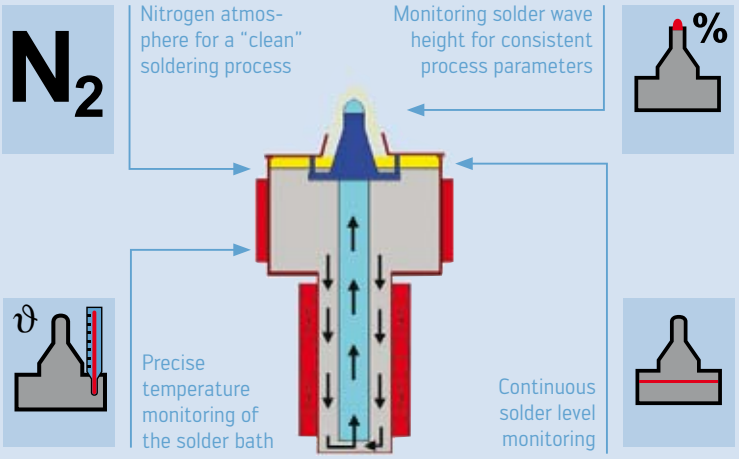
The automatic nozzle activation assures a constant quality of the wettable nozzle surface. The benefits of a wettable nozzle surface are obvious: since there is no preferred direction for the solder to flow off the tip of the nozzle, the wave can operate and be moved in all directions.

All VERSAFLOW 3's, starting with the basic system, are fitted with a high precision axis system. If board assemblies are to be soldered which can not, on account of imprecise leading edges, be accurately placed at the stopper, the VERSAFLOW 3 offers an optional fiducial recognition system. Any positioning inaccuracies that may lead to process problems can thus be eliminated.

To detect board deflection or warpages, a laser distance measuring feature is available.

Advantages Ersa induction pump:

- Electromagnetic solder pump
- Very low maintenance required
- No moving parts
- Exact and finely tuneable solder wave height
- Quick-change solder nozzles
- High temperature stability at the solder nozzle
- Very effective heat transfer (low energy and N_2 consumption)
- High precision of the controls allows operation at lowest solder temperature



Ersa Induction Pump – The heart of the selective soldering machine extremely low-maintenance, with constant flow rate and best temperature stability

The Ersa Dual Pot System
Highest productivity and top flexibility on smallest footprint

Visual process control; An optional camera system depicts the soldering results

A significant added value for the production is generated by the innovative Ersa dual pot selective soldering systems. Such configurations are recommended where panels are being processed, as it will double the throughput. It will also add flexibility, as it is now possible to have two different alloys on board without having to change out the solder bath.

On the upper right hand side, a configuration showing two solder bath with the well-proven, low maintenance electro-magnetic pumps is depicted. An additional lifting unit is added, so that both solder baths can be activated independently of each other. Activation is via the solder program, which allows for the use of two different alloys. Long retooling times due to pot changes are now a thing of the past. PCB's can be processed in batch size 1, without having to be concerned over cross contamination of the solders. As an alternative, this configuration can be used for the implementation of two different sized nozzles. Boards with connectors can be processed efficiently using a nozzle with a large diameter, while those areas on the assembly where the operating space is constrained can be processed with a very small diameter nozzle.

The two pictures on the lower right hand side depict the dual pot configuration where the pots can be moved in the y-direction. Both pots are always activated together, yet the distance between the nozzles is freely adjustable. This allows panels to be processed efficiently.

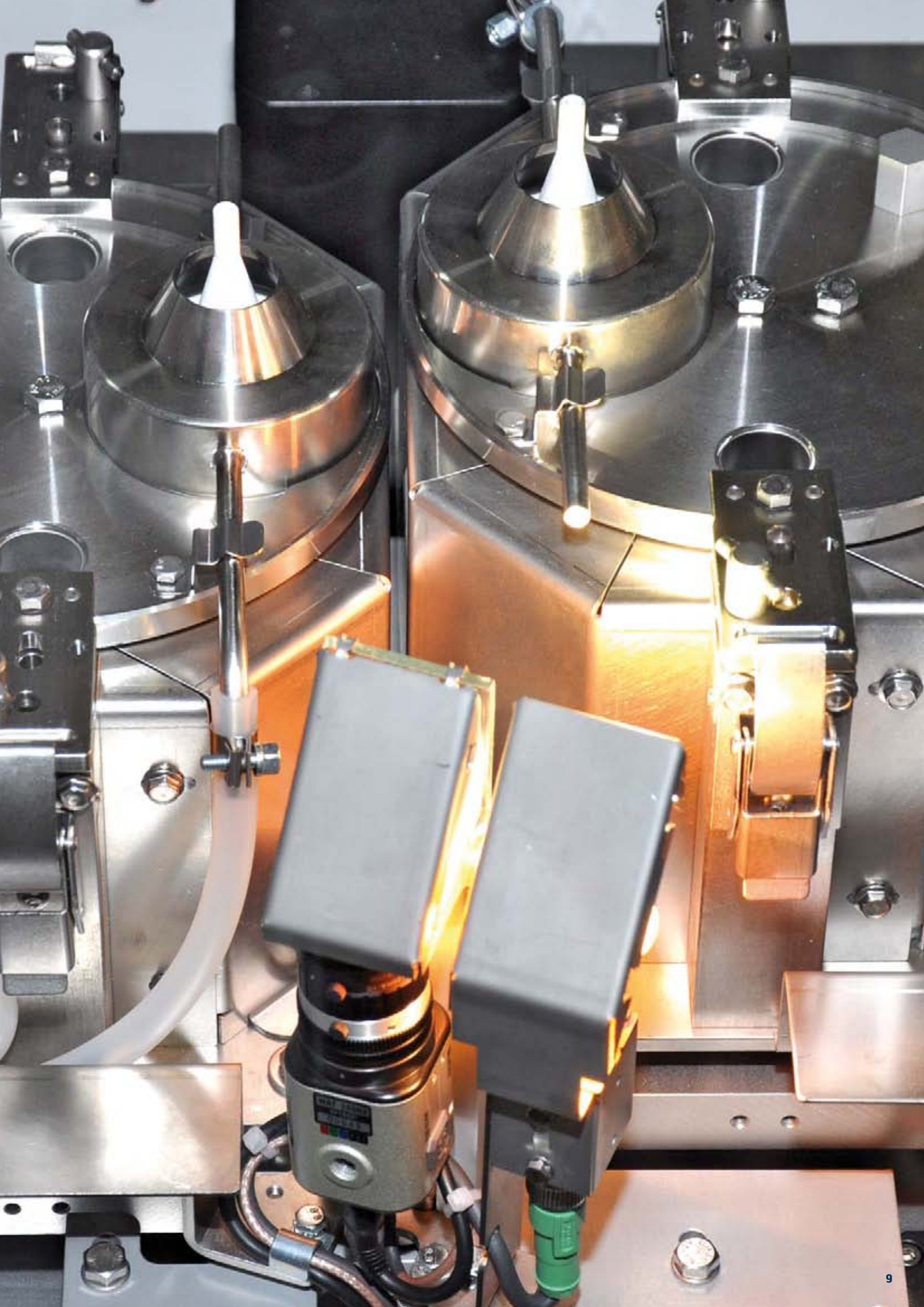
Worth to note is the fact, that the power setting (wave height for each nozzle) and the solder level are monitored independently for each bath.

Variable z-axis on solder bath

Different nozzle diameters

Variable y-axis the distance between solder nozzles is adjustable between 80 and 200 mm, providing an efficient method to process panels

Dual pot with dynamic precision 3-axis system



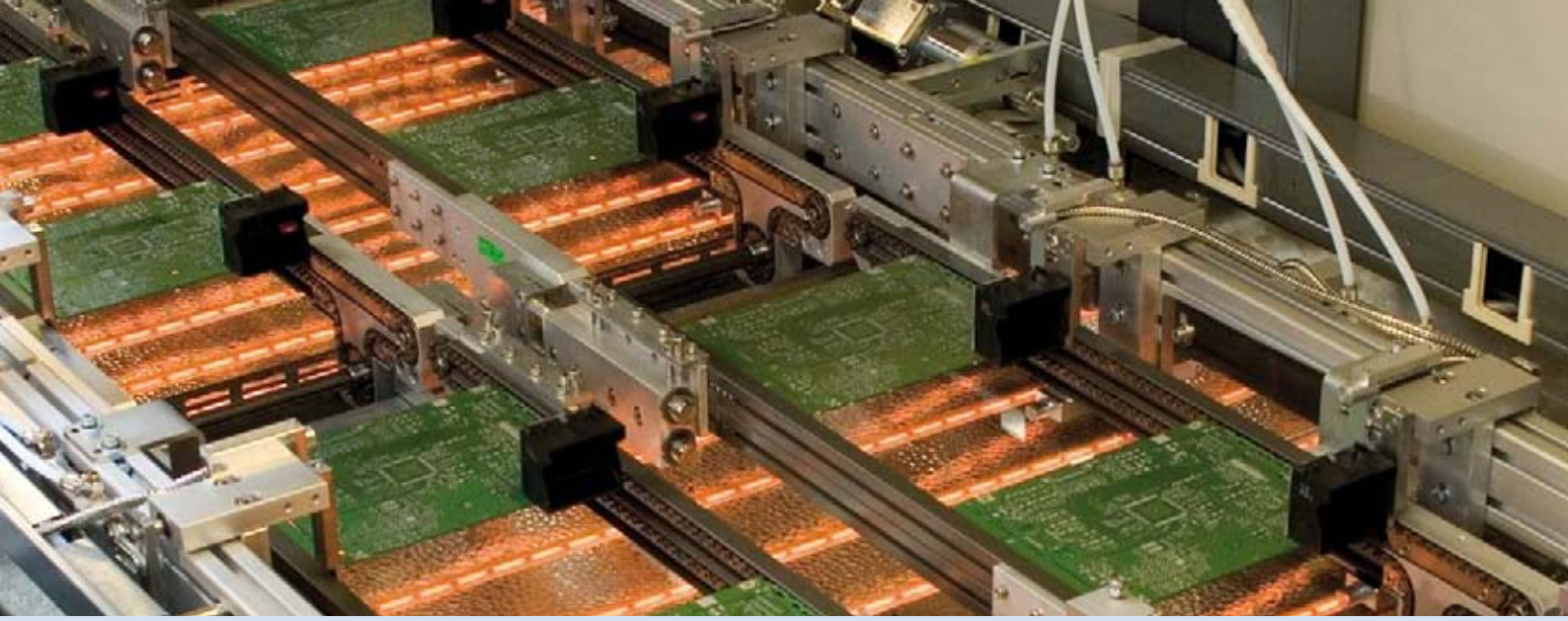
High or Very High Throughput?
Flexible concept for the most different requirements

Dual pot system with 2 single waves to process panels

In order to achieve higher through put rates, Ersa selective soldering systems offer a number of features. The ECOSELECT can be specified with two single-wave solder pots with variably adjustable nozzle distance, allowing for an efficient method to process PCB panels. This feature is equally available for the ECOCELL and the VERSAFLOW 3.

Additionally, the preheater modules in the VERSAFLOW 3 can be segmented. If only a small number of solder joints need to be soldered, the preheating section will be the bottle neck, determining the final cycle time. This can be alleviated by segmenting the preheat area, effectively halving the cycle time. By extending the system with one or two additional solder modules, the soldering process can be distributed over more than one solder module. The length of stay of the board in the individual module will be substantially reduced, thus increasing throughput.

For those products being produced in very high volumes, consideration should be given to installing a second conveyor track. In this case, each solder modules x/y/z table can be equipped with two single-wave solder baths, for a total of 4 nozzles. PCB's on track 1 and track 2 will be processed simultaneously.



Dual track system doubling of throughput without increasing floor space

Advantages single wave:

- High flexibility on account of the programmable x/y/z movement of the axis
- Individual parameterization of each solder joint
- No preferred process direction during soldering
- No tooling costs
- No production loss due to retooling

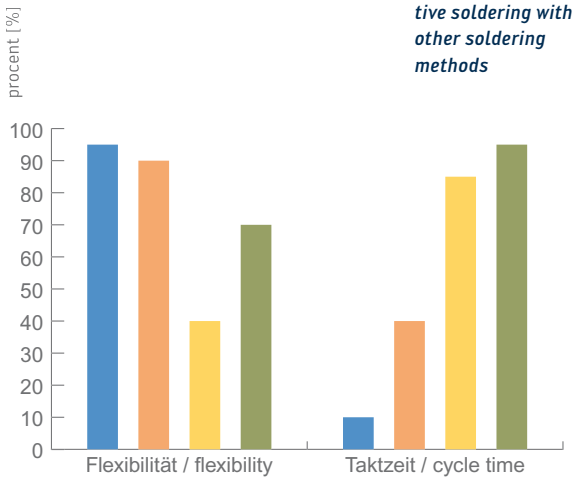
Advantages Multiwave:

- Short cycle times due to the sequential soldering
- Cycle time is independent of the number of solder joints to be made

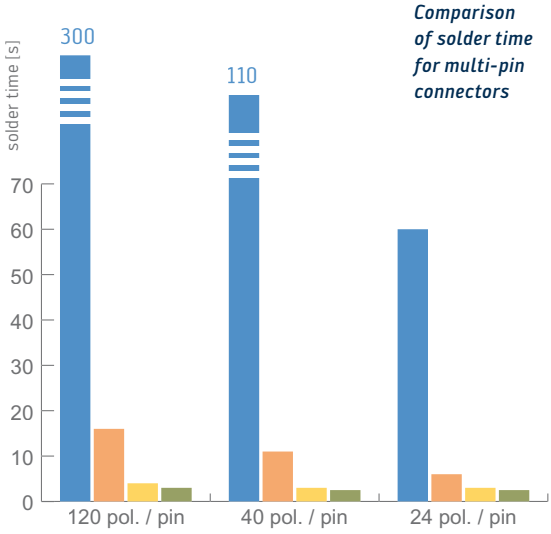
Multi wave application on single wave unit

View of part of a multiwave nozzle plate

Flexible and fast – comparison of selective soldering with other soldering methods



Comparison of solder time for multi-pin connectors



Hand soldering | Single wave | Multi wave | Wave soldering

VERSAFLOW 3

The worldwide leading selective system for a perfect selective soldering process

Dual conveyor doubles the throughput without increasing floorspace

To satisfy all demands with regard to flexibility, Ersa has based the design of the third generation VERSAFLOW on a fully modular machine platform. A basic VERSAFLOW 3 consists of the customary fluxer-, preheat- and solder modules and a segmented transport conveyor system. Depending on the application and the required through put rate, additional fluxer, and/or preheat and/or solder modules can be integrated. In the maximum configuration, a VERSAFLOW 3 can consist of up to 3 solder modules, with each module being fitted with 2 single wave solder bath. Upstream of each additional solder module, a preheater is installed.

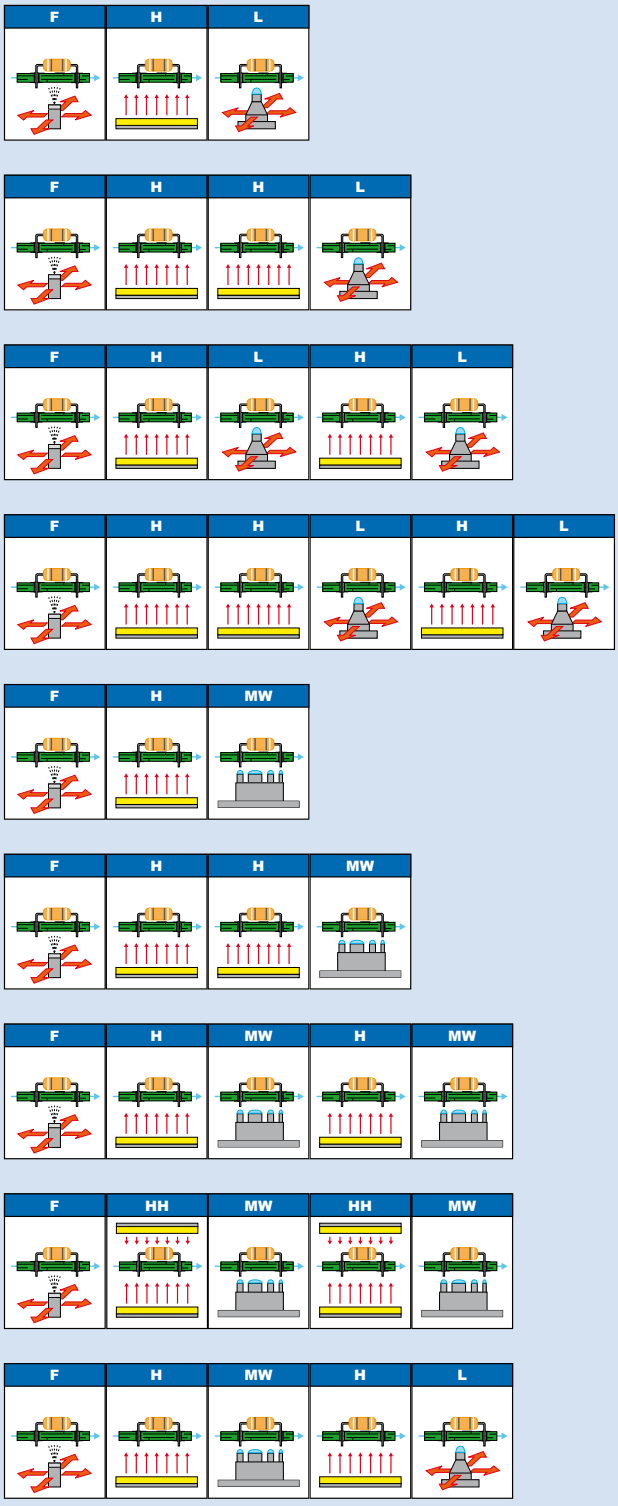
As an alternative to the single wave solder pots, it is also possible to install a multiwave solder bath. In the preheat areas, as well as over the single wave solder baths, upper preheater cassettes can optionally be fitted. With an optional dual track, the throughput rate can be doubled, without increasing the footprint of the system. And if the size of the PCB permits segmenting of the preheaters, a further increase in the throughput rate can be achieved. If all the options are being exhausted, and a maximum configured system is specified, then up to 22 PCB's can be processed at the same time in varying positions within the system.

VERSAFLOW 3: Selective soldering system with dual pot for highest demands on throughput and flexibility

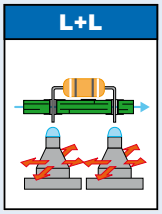
The Ersa Modular-System

Always the right combination for your needs and your budget

Below combinations of the arrangement of different modules show only some of the possibilities of the extremely flexible Ersa modular system concept. Depending on a customer's request, with the addition of the optional dual pot feature and/or the dual track feature, throughput could be substantially enhanced without increasing floor space requirements.

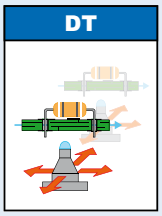


+ Dual pot option



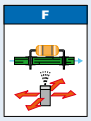
The adjoining examples of varying combinations are based on one solder module (L) with a single nozzle. Optionally, this solder module could be fitted with an additional solder bath and a second solder nozzle (LL).

+ Dual track option

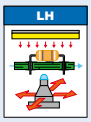


By adding a second track (DT), throughput can be doubled. Should the system be fitted with 2 single nozzle solder pots, then two identical assemblies could be processed at the same time.

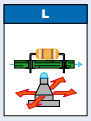
Legend:



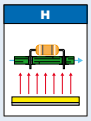
Fluxer module fitted with flux spray unit



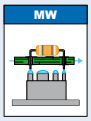
Solder module with single wave unit and top-site preheat



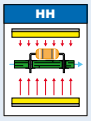
Solder module with single wave unit



Preheat module fitted with button-site preheat



Solder module fitted with multi-wave solder bath



Preheat module with button-site and top-site preheat

ERSASOFT
Operating – Documenting – Controlling

Software-Highlights:

- **Traceability data acquisition pursuant to ZVEI Standard (included)**
- **Solder protocol, Process recorder, alarm management (included)**
- **Comfortable touch screenoperation**
- **Easy and intuitively to operate**
- **Downwards compatibility**
- **Linking to management execution program (MES) possible**

ERSASOFT stands for easy operation and optimized equipment availability

All Ersa selective soldering systems are operated with ERSASOFT, the dedicated PC-software. This machine visualization software offers numerous functions, which allow for an error-free operation of the system by the operator.

During the design of the user interface, great care was taken to make data entry a comfortable task. To achieve this, the icons of the touch screen were given adequate size. Identified by colour and uniformly structured, the dialogues provided offer quick orientation. Through clear distinction of the entry masks from the dialogues for the basic equipment configuration, it is virtually not possible for the system operator to lose the general overview. The clearly structured build of the software is intuitive to grasp, and the operation of the system is therefore easy to learn. Faulty operation of the system is prevented through the assignment of competency based and multi-level user rights.

All selective systems manufactured by Ersa are operated with ERSASOFT. But only that data which pertains to the configuration of the actual system is being shown on the display.

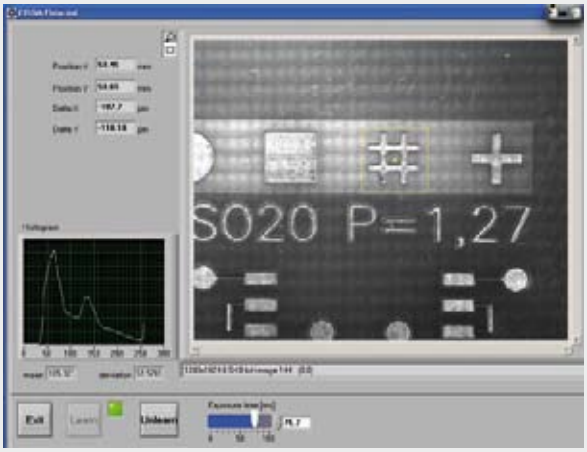
For someone who has worked already with an Ersa reflow or wave soldering system, the analogue structure of the software is very quickly recognized. In view of this, it becomes apparent that, in this case, the training needs of the future operator of an Ersa selective soldering system is kept at a bare minimum.

Standard features of the ERSASOFT software is a process recorder, which continuously records the actual values of all aggregates that are important for the solder process, as well as the solder protocol, that stores all the process data that is important for traceability. Also incorporated is an extensive alarm management file. All messages received from the system are stored with a time stamp and signed-in user identification. All the data is available in the XML format, and can therefore easily be worked on in higher systems.

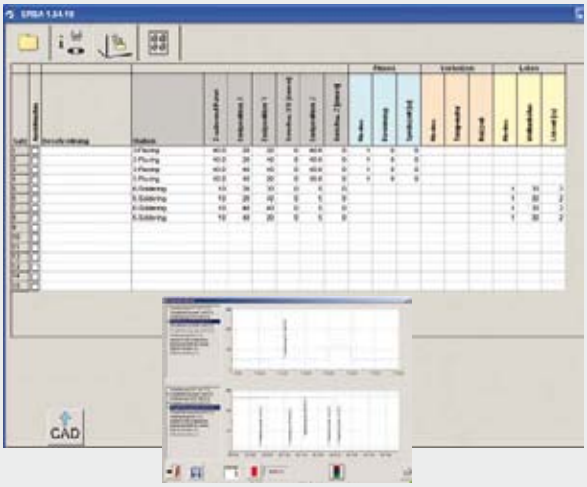
Special mention is made of the fact that all ERSASOFT software within one system generation is completely downward compatible. That means, that a customer can be certain, that any innovative software function that will be developed after he has taken delivery of his unit can be added to his system.

Fast, Intuitive and Comfortable

Efficient creation of solder programs with the Ersa CAD-Assistant



Fiducial recognition



Navigation with the help of equipment visualisation example process recorder

Taking over from an image file

Graphical offline programming

The efficient generation of complex solder programs, especially for selective soldering systems, is of great importance. As quickly as possible, and free of errors, that is the motto. Equipment that is stopped costs money, and that is not acceptable.

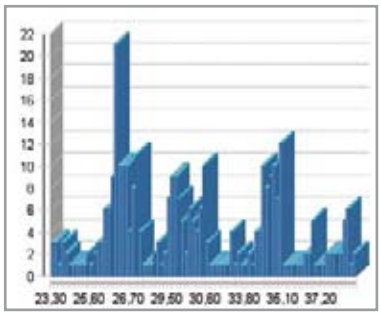
ERSASOFT and the complementing CAD assistant are great tools to avoid this. The possibility that programs can be generated off-line maximises equipment uptime. At the same time, the software offers comfortable ways to quickly and easily get to the desired solder program.

The solder program editor is build according to the specific equipment configuration, and it shows the data set for the CNC-axis systems clearly arranged in tabular form. Errors during the program creation are prevented by a plausibility check.

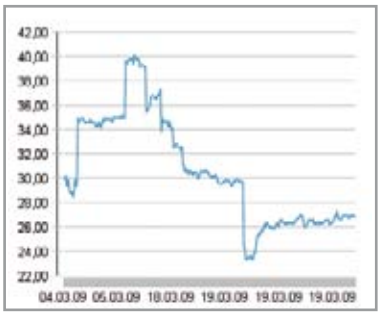
With the CAD assistant, DFX data of the PCB's can be entered. Alternatively, images of the board generated on a scanner could be used. All movements of the fluxer axis as well as the solder bath axis are graphically entered on the image of the board, after which the process data is added. Program files created with the help of the CAD assistant are immediately ready for use. Modifications, entered with the program editor of ERSAOSFT, are graphically visible also in the CAD assistant.

Ready for Traceability

An interface to make the production process transparent is on board



Histogram



Value pattern

The high demands on quality in the electronic manufacturing industry, put on both OEM and EMS suppliers, call for secured product traceability. It has to be possible that each component or assembly can be traced back to its place of origin, to the date of production and to the relevant process data. With the help of a positive means of identification, the origin of the final product can be traced back through its complete supply chain, right up to the individual component. Defects, its causes and the manufacturer responsible for the defect, can be (in case of a recall, for example) quickly and with certainty identified. Effort and financial losses due to such measures can thus be much reduced. Ersa has anticipated this requirement and is fitting all selective soldering systems with a data interface, which complies with the ZVEI standard. With this, all process data is available in the XML format, and can therefore easily be worked on in higher systems.

In this way

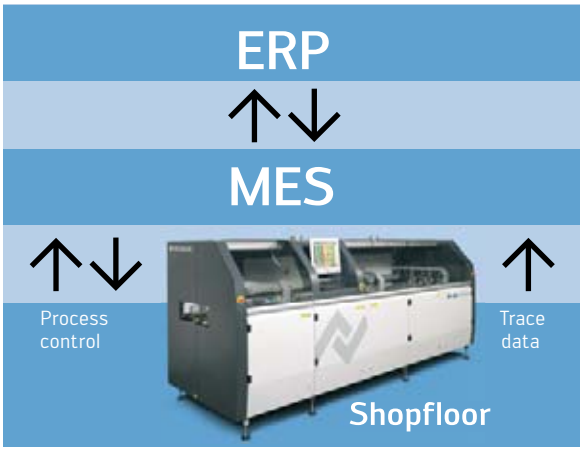
- It is documented, when and with which parameters a specific board was soldered
- It is possible to analyze the process data (process monitoring) with a view to the permissible limit values
- Process data can be assigned to specific serial numbers (process trace)

Traceability and quality assurance of the products manufactured are thereby assured. In addition to this, the possibility exists to integrate an Ersa selective soldering system into the process control of a Manufacturing Execution System (MES). Such systems release the process only after having verified the plausibility of the job data with the set-up of the selective soldering system.

This process interlock warrants that

- No further flawed products are being produced
- Faulty products are detected and removed from the line
- The process sequence is being maintained

An interface especially developed for this feature facilitates the integration of all MES currently available on the market.



ECOCELL

Not compromising when it comes to throughput – flexible in the production layout

Ersa, the world wide technology leader in the field of selective soldering, enhances its portfolio with the ECOCELL, a system ideally suited for the new production methods contemplated by many users. With its counter-clockwise flow, the ECOCELL follows the Toyota principle. The u-shaped layout is ideal for users that plan to manufacture in production islands, yet it can also be integrated, through its side feed, into a production line.

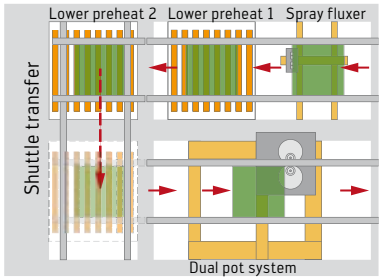
In the ECOCELL, high throughput and high flexibility are not contradictory. With two preheaters integrated, up to 4 boards can be processed simultaneously, and if a second solder bath is added to the axis, panels can be soldered very efficiently. Likewise, when a single wave pot or two single wave pots are installed, different alloys could be made available on the system. This feature, as well as the possibility to perform maintenance or change nozzles on one of the bath while the other continues to operate, reduces production losses to a minimum. The well-proven precision spray fluxing system is also installed in the ECOCELL. Thanks to the integrated spray stream monitoring feature, flux application, whether in points or in tracks, is performed with reproducible high quality. The bottom side short wave IR emitters can be complemented with an optional upper convection preheater. This combination of preheats assures homo-geneous heating of even the most complex PC boards. An optional convection heater mounted over the single wave solder bath maintains the board temperature during a lengthy solder cycle. When soldering on the 0° level, bridging will not be a problem on account of the "peel-off" feature developed by Ersa, assuring lowest DPM's. To deliver solder to the wave, induction pumps are used. Therefore, the baths require very low maintenance, and there are virtually no wear parts.

Programming of the system software is intuitively based and very effective and all relevant process parameters are recorded in accordance with the ZVEI standard (traceability). The graphical programming interface via the CAD Assistant 2 permits very fast and facile offline programming. It is not required that the system is taken out of production, assuring maximum availability of the system for production.

Precision spray fluxer with integrated spray stream control

Alternatively to the single wave pot, multi wave pots are also available

Lower preheater with short wave IR emitters



Schematic layout of the board transfer direction

ECOSELECT 1 and ECOSELECT 2
Perfect for stand-alone manufacturing concepts

ECOSELECT 1
the perfect start-up solution for efficient and reproducible soldering processes in small-scale and customized production

ECOSELECT 2
In-line and off-line selective soldering systems with an optimal price/performance ratio

ECOSELECT 1
Even in the smallest Ersa selective solder system, the convincing technology with superior temperature stability at the solder nozzle tip and dual pot configuration is made available

The ECOSELECTs are ideal for small production environments and for manufacturers using a cell concept. They represent the optimal solution when small to medium production is common, which calls for high flexibility and for quick and easy product changes. But even though the ECOSELECTs are budget-oriented systems, they do not ask for compromises in system performance from the user. The process steps fluxing, preheating and soldering are performed with the same high quality as they are found in the high-end systems. The precision fluxer, the full-area preheaters and the low maintenance solder bath with the proven electromagnetic pump are standard features also on these low-budget systems.

The process steps are executed in the order fluxing, preheating and soldering. As a consequence, there are no constraints if water based fluxes are going to be used. The preheat and the solder process can thermally be supported by top side preheaters. Likewise, a second solder bath could be specified, and features such as process viewing cameras, CAD supported program generation, fiducial- and warpage recognition are also optionally available. The ECOSELECT 2 is fitted with a conveyor systems, that is suitable for in-line or off-line operation. An in-line interface available permits fully automatic operation.

The ECOSELECT 1 differs in that the boards to be soldered are placed manually into a universal arrier, which is then placed into the process chamber and, after the process steps have been completed, is removed from there again.

Ersa Services
Our global commitment for your success

Ersa's Application Centre Customers and prospective customers appreciate the services offered by the application centre, such as holding solder trials or to evaluate the performance of the equipment

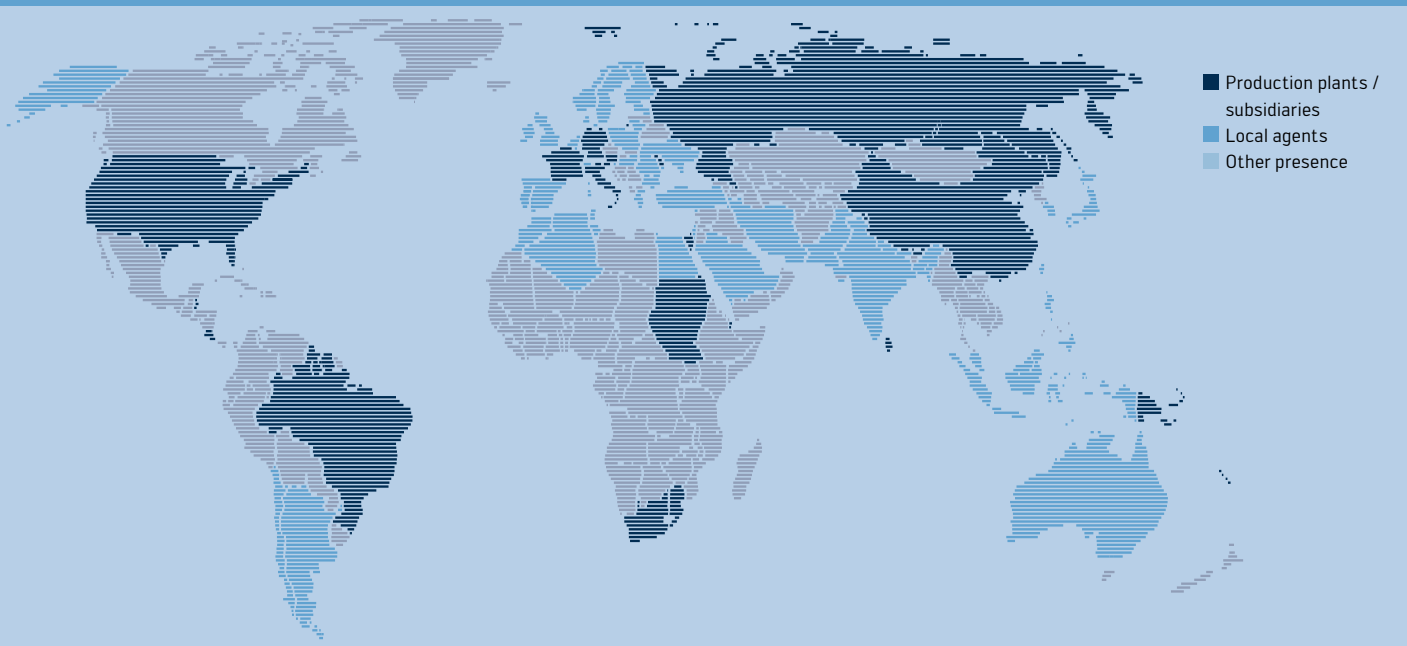
Pursuant to our corporate philosophy are we offering services and trouble shooting/process improvement packages, which will assist our customers in optimizing their manufacturing process. We at Ersa are proud to offer our extensive technical assistance. Our expertise does not only encompass process related issues, but also those related to the economical aspects of Total Cost of Ownership can be discussed. When it comes to determining the optimal process parameters for their own assemblies, our customers will receive competent assistance from our application specialists stationed in our fully equipped application centres in Europe, North America and China. To establish a good thermal profile or to improve on one of their own generated profiles, boards can also be sent to these centres.

The Ersa Know-How Series of seminars, established now for many years, has been attended by more than 5500 satisfied participants, and has made for itself a good reputation in the industry as a means to improve the qualification of ones employees. Phone support, remote maintenance and service advice are integral components of our Total Service Philosophy. Ersa is also a certified training centre and educates and trains, following unified standards, manual soldering operators. Upon their return to their workplaces the trainees cut costs and reduce failure rates.

Service packages, tailored to a customer's specific need, are also available from Ersa, as is TCO (Total Cost of Ownership) consultation. Finally, and as a matter of course, in case of problems, our world-wide 24 hour spare parts- and service organization is at the customer's disposition.

Ersa has an excellent reputation for know-how transfer through operator training sessions and seminars

Electronics Production Equipment



America
Ersa North America
1779 Pilgrim Road
Plymouth, WI 53073
USA
Tel. 800-363-3772
Fax +1 920-893-3322
info-ena@kurtzersa.com
www.ersa.com

Asia
Ersa Asia Pacific
Flat A, 12/F, Max Share Centre
373 King's Road
North Point, Hong Kong
China
Tel. +852 2331 2232
Fax +852 2758 7749
info-eap@kurtzersa.com
www.ersa.com

Ersa Shanghai
Room 720, Tian Xiang Building
No. 1068 Mao Tai Rd.
Shanghai 200336
China
Tel. +86 213126 0818
Fax +86 215239 2001
info-esh@kurtzersa.com
www.ersa.com

France
Ersa France
Division de Kurtz France S.A.R.L
15 rue de la Sucharde
21800 Cevigny Saint Sauveur
France
Tel. +33 3 80 56 66 10
Fax +33 3 80 56 66 16
info@ersa-electronics.fr
www.ersa-electronics.fr

Kurtz Holding GmbH & Co.
Beteiligungs KG
Frankenstr. 2
97892 Kreuzwertheim
Tel. +49 9342 807-0
Fax +49 9342 807-404
info@kurtzersa.de
www.kurtzersa.de

Ersa GmbH (Headquarters)
Leonhard-Karl-Str. 24
97877 Wertheim/Germany

Tel. +49 9342 800-0
Fax +49 9342 800-127
info@ersa.de
www.ersa.com

kurtz ersa