



VERSAFLOW 3/45

Modular Selective Platform for Highly Efficient
& Flexible In-Line Soldering

SELECTIVE SOLDERING



VERSAFLOW 3/45

Dual track machine with dual flux, preheat and solder modules

VERSAFLOW 3/45

Optimized Efficiency Combined With Highest Flexibility

Modular & Compact Machine Platform Increases Productivity, Flexibility & Reduces Costs

ERSA, a world market leader for in-line selective soldering systems for the past decade, has successfully launched its third generation of selective machines in the premium segment, the VERSAFLOW 3 Series.

Increased production efficiency, increased throughput & flexibility and reduced floor space requirements & running costs, make up just a few of the technology highlights of the VERSAFLOW 3.

The VERSAFLOW 3/45 encompasses a new, modular machine platform which offers a significant saving in floor space when compared to the previous VERSAFLOW systems.

The basic version of an in-line selective solder system has three functional modules: a flux, a preheat and a solder module complemented by a segmented conveyor system. Yet, through its unrestricted system configuration possibilities, the VERSAFLOW 3 can be custom trimmed to ideally suit the users requirements in regards to process and production throughput.

MODULAR PLATFORM

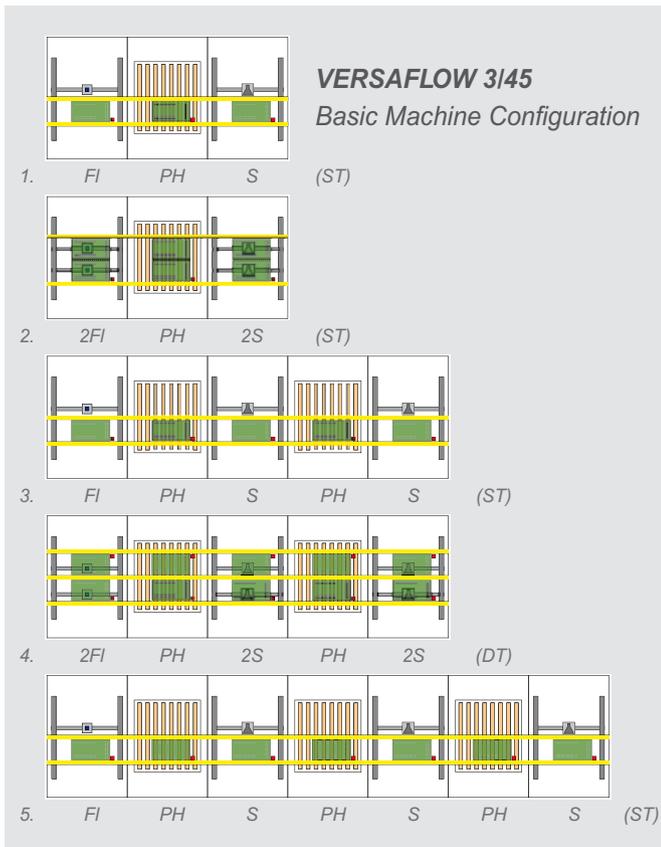


Table 1: FI = Flux Module, PH = Preheat Module, S = Solder Module, ST = Single track transport, DT = Dual track transport
This table shows only some of the many possible configurations.

The VERSAFLOW selective solder nozzle and pot

The revolutionary design of the ERSA VERSAFLOW selective solder nozzle and pot offer a level of solder joint process control never before dreamed of in a production soldering process.

All dynamic and static functions such as solder level, wave height and solder temperature are continually monitored & traceable. The maintenance-free, electromagnetically operated solder delivery system ensures a constant solder flow rate with no moving parts. Exact wave height is precisely adjustable for repeatable results.

VERSAFLOW guarantees perfect solder joint definition and reproducibility, as well as complete documentation of individual solder parameters. All of these unique features combine with the improved solder wave peel-off function to offer individually programmable process parameters per solder joint!

Advantages of VERSAFLOW Technology:

- ▼ High flexibility due to modular design
Solder modules with single nozzles and/or multijet solder nozzle plates
- ▼ Dual pot systems for the use of different solder alloys or for processing multi-up panels
- ▼ Highest solder joint quality and significant reduction of DPM – DPM approaching Zero Defect
- ▼ Shorter cycle times than in manual/robotic soldering
- ▼ Dual track conveyor for increased throughput (parallel processing in flux, preheat and solder module)
- ▼ High process safety, soldering at 0°; PCB stationary during the soldering process
- ▼ Optimal capillary rise when processing heavy-mass multilayer boards via top-side convection heating in the solder module
- ▼ Increased positioning accuracy
- ▼ Intuitive software with extensive process documentation
- ▼ Communication with Manufacturing Execution Systems (EMS), process controls and trace data acquisition
- ▼ Graphic based programming, therefore program generation efficient and easy

Near Zero Defect Soldering

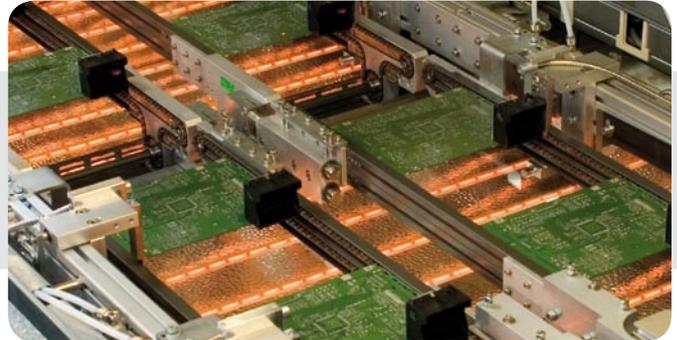
For product groups, requiring highest reliability and quality level of the assemblies, manual soldering does not provide the measure of repeatability that is possible to achieve in the automated wave soldering process. But with today's pressures to cut operating costs, conventional wave soldering is not a practical and viable alternative anymore. Production costs in conventional wave soldering are substantially higher than in the selective process. Due to the large amount of solder used, higher maintenance costs, and the increased amount of oxides (dross), charging a wave solder bath with solder costs many multiples of a selective system's bath filling, even more so when it is for the lead-free process. The short life expectancy of the solder in the bath due to copper contamination, higher costs for nitrogen and a higher defect and scrap rate are additional factors, which might call for the introduction of the selective in place of the conventional wave soldering process. The VERSAFLOW selective soldering process advantages of "Better, Faster, Cleaner & Cheaper" can translate not only into a tremendous increase in the soldering quality, but also into significant costs savings!

FLUX

PREHEAT



Dual track fluxing



Dual track preheating

Depending on the application at hand, multiple solder pots, fluxers and/or preheaters can be integrated into the system. Some possible system configurations, from the smallest to the largest configuration, are depicted in condensed form in table 1.

Precision Fluxing Efficiency

VERSAFLOW 3 machines integrate a programmable, precision micro drop fluxing system for selective point or track fluxing with automatic spray accuracy control. The flux head delivers an absolutely precise & defined amount of flux to the smallest of areas on the PCB.

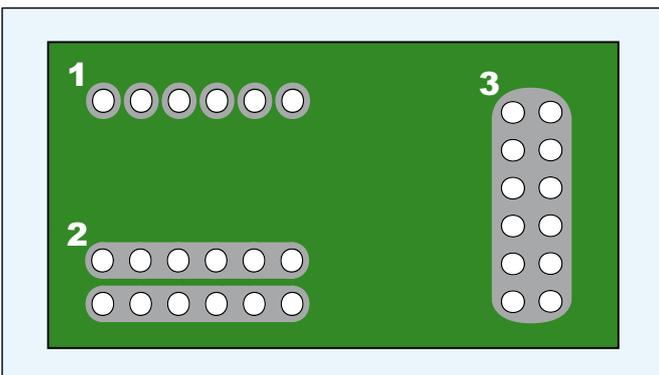
The flux pattern on the joint can be either focused dots or tracks of flux as small as 3 mm! In this way, only the precise amount of flux required is utilized, thereby reducing flux waste and keeping ionic contamination to

an absolute minimum. For multi panel applications, up to 4 individually synchronized working spray heads can be installed per flux module

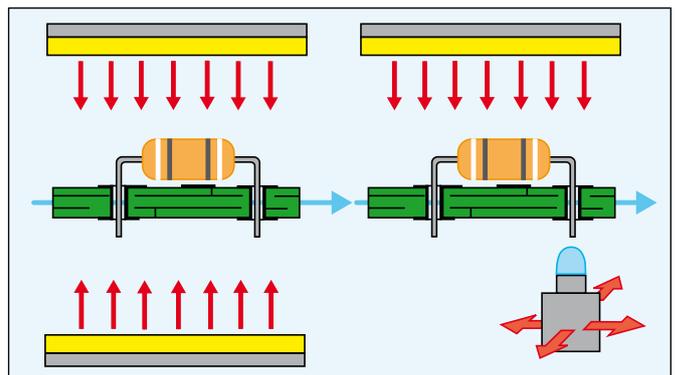
Preheating Flexibility

The VERSAFLOW 3 combines three different heating technologies from both the top & bottom-side guaranteeing the greatest preheat flexibility. Bottom-side short wavelength IR, top-side convection heating technology as well as a new top side hybrid heating technology extends the process flexibility for the preheating of high-mass assemblies.

All energy efficient bottom-side preheating cassettes are segmented; depending on the specific job requirement; preheat configuration or total length can be varied in order to ensure optimum efficiency and maximum workflow flexibility.



1. Flux dots, 3 mm; 2. Flux tracks, 3 mm ea.; 3. Flux track, 6 mm



Bottom-side short wavelength IR & top-side, convection heating technology

SOLDER



Dual track soldering



Multi wave solder module

Highest Efficiency In-Line Soldering via Parallel Processing & Dual Track Option

The VERSAFLOW 3/45 has the shortest cycle time due to the parallel processing on the individual modules. Multiple fluxing heads or solder nozzles can be attached to the same axis system to increase the throughput.

For soldering with two different solder alloys on the system, two solder pots can be installed in one solder module. Similarly, two fluxers can be installed for two different flux formulations. This configuration enables the user to process different boards requiring different alloys in batch size 1 without loss of time due to a change over.

The VERSAFLOW 3 also offers the very first dual track capability seen in an in-line selective machine. The greatest flexibility and the highest volume throughput can be achieved at a minimum of required floor space. Simultaneous processing in the machine of up to 22 PCBs is now possible. Up to six solder pots and four flux spray heads can run simultaneously in the machine offering the highest volume throughput in a league of its own. The entire transport is segmented for frameless production and guarantees the fastest product change.

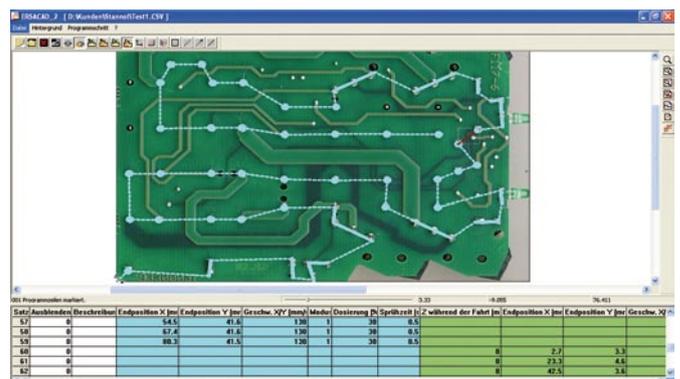
Finally, the process visualization feature as well as the improved serviceability at the front & back side of the machine rounds off the added value of the new design.

On & Off- Line Programming and Machine Software

The CAD Assistant software allows for simple and fast off-line programming and thereby ensures that the machine stays in production while new programs are being generated. To program a board, data supplied in the DXF file format is being used, or, alternatively, you can simply scan in the PCB and mark the relevant areas by drag and drop programming.

The VERSASOFT machine software constantly monitors all process related parameters on the screen and all data can be stored in log files for traceability requirements.

The soldering process of all individual nozzles is permanently observed by cameras in real-time and can be seen on the screen.



Drag and drop programming using DXF or picture data