

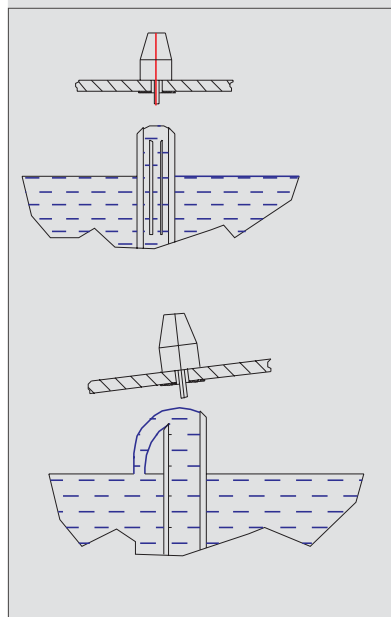
Selective Soldering with Miniwave



■ Adaptable
to specific
soldering tasks

■ Nitrogen
atmosphere

■ Maintenance free

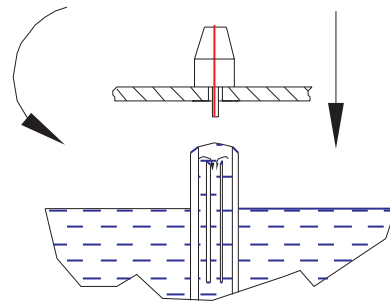


Principle

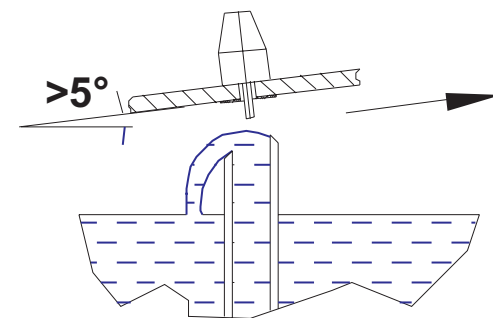
Selective soldering is basically a variation of the well known wave soldering. On conventional wave soldering machines the complete printed surface board (PCB) is wetted by tin of the solder wave. Selective soldering means, that only defined areas of the PCB are soldered. Selective soldering can be separated in two principles:

- Miniwave external flow: The PCB is dragged over the miniwave
- Miniwave in-flow: The PCB is dipped into the miniwave

Miniwave in-flow



Miniwave external flow



Flux application

By **spraying of flux** very thin flux layers can be applied. If the fluxed area must be precisely limited, masks as cover must be used. These masks must be cleaned regularly.

Process sequence:

1. Application of flux by spraying, dipping or micro-drop-application.
2. Preheating by convection (hot air) or radiation (infrared radiation)
3. Soldering (PCB dragged in an angle or dipped into the miniwave)

The workpiece (PCB) is dipped in vertical direction into the miniwave. To remove possible tin oxid from the surface, the miniwave is circulating "inside" the nozzle. Even with small nozzles with a diameter as small as 5 mm the solder does not cool down (freeze).

To reduce oxidation during soldering, there is a laminar nitrogen gas flow around the nozzle.

The PCB is dragged in an angle of 10° to 5° over the miniwave against the direction of the solder flow. In this way also comparatively large areas of the PCB can be soldered. To prevent solder bridges the PCB must be moved in an angle of more than 5° . To prevent oxidation during soldering and to improve soldering quality a nitrogen gas flow around the nozzle is necessary.

Preheating

Convection heating with hot air is the best method to preheat the complete PCB. With this method the heat time is quite long. It is difficult to shield some areas which are heat sensitive.

With **high-power halogen lamps** the PCB is heated rapidly through infrared radiation. With masks it is easy to shield some areas which are heat sensitive.

Application

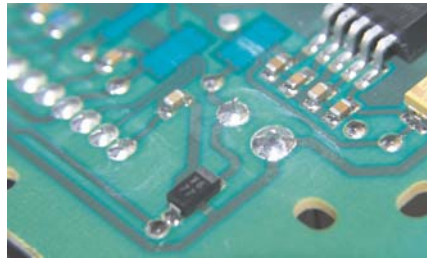
On many PCB's there are still some leaded components left, which cannot be soldered in a reflow process. These have to be soldered separately in a selective soldering process. If there is a larger number of through hole solder joints left, selective soldering with a miniwave is an ideal method.

Miniwave soldering can be applied if there is an area of approximately 2 mm around the solder spot without neighboring components. With quick-changeable solder nozzles selective soldering with miniwave has a high flexibility.

It can be used for the tinning of coated CU-wires as well as solder spots on different kinds of PCB's.



Connector with high pin number soldered into an flexible print



Connector with one pin row and a component with two pins soldered into a PCB

Advantages

- ... Compared to point-to-point soldering (iron soldering, laser soldering)
- + Higher productivity as more than one solder spot is soldered in one step
- + Higher and more constant soldering quality
- + Easier set-up

Machines

Selective soldering systems can be built as fully automatic systems being part of a complete production line or as stand-alone workplaces. All machines base on Wolf production-modules (see separate product-info "Production-Modules")

Depending on the specific soldering task, selective soldering machines can have a different structure.

All machine components are almost maintenance free. The solder-bath is die-casted and the material of the pump wheel is titanium.

Therefore these parts have a superior lifetime, compared to parts from stainless steel.

Wolf Selective Soldering Systems feature:

- Robust structure and outstanding design
- Miniwave with nitrogen flow
- Programmable precision linear axis for the Handling of the PCB's- and the movement during soldering
- Soldering nozzles are quick-changeable
- Modulare structure
- Integrated solder fume extraction
- Automatic level control of the solder bath
- Control of all solder-parameters

Application 1

Synopsis of custom-made machine:

- Product: PCB for car instrument panel
- In-flow miniwave with a diameter of 5 mm for the soldering of single solder spots
- Level (height) of the miniwave programmable (variation of the speed of the pump)
- Cycle-time: 1.5 s per solder joint
- Solder and flux positions programmable
- Flux application by spraying with automatic function control
- Preheating of the flux by hot air flow
- Manually turned rotary-index-table
- Human machine interface with text display and touch panel.



Application 2

For more application examples, please see our website



Synopsis of custom-made machine:

- Product: Connector with 80 pins surrounded by a cooling plate
- Cycle-time: 21 s per connector
- In-flow miniwave which covers the complete soldering area
- Level (height) of the miniwave programmable (variation of the speed of the pump)
- Rotation of the part during lifting up from the solder wave to prevent solder bridges
- Flux application by spraying
- Preheating by hot air flow with temperature control
- Human machine interface with text display and touch-panel.

wolf
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Special Soldering

**Assembly
Automation**