

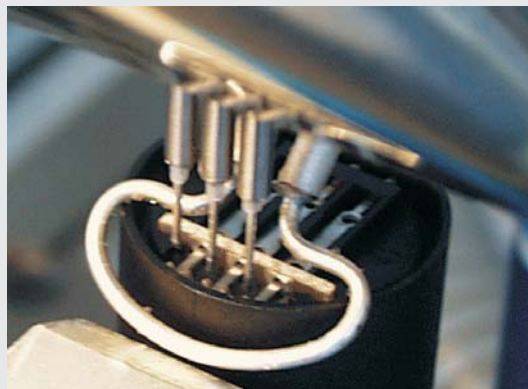
# Induction-Soldering



■ **Contact-free**

■ **Heat-transfer extremely fast and thorough**

■ **Little maintenance requirements**



## Principle

The energy input of the high-frequency induction-soldering results from a high-frequency AC-current in a coil with one or more windings. This coil, named inductor shows an electromagnetic field within its surrounding. In any metal brought into this electromagnetic field a voltage will be induced, which results in an electrical current.

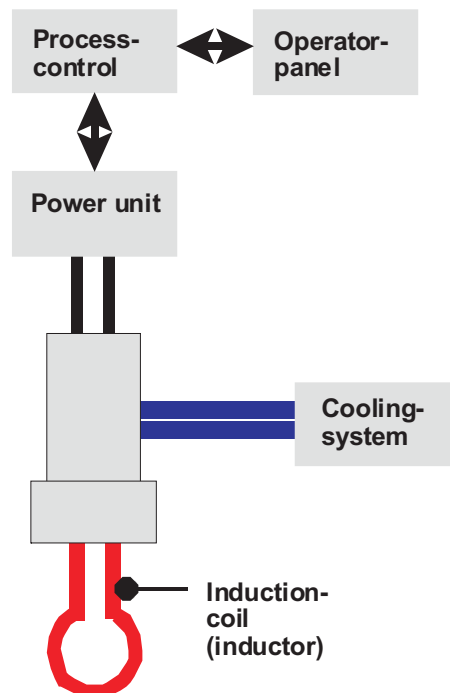
According to Joule ( $Q=J^2 \times R \times t$ ) on the surface of the metal where an electrical current flows will be heated up.

Induction heating is working like a transformer: The inductor represents the primary winding and the workpiece represents the secondary winding.

The inductor must be watercooled, otherwise it will be destroyed by exceeding heat.

The inductor must be adapted to the individual workpiece. It needs much experience and some experimental work to find the optimum shape.

## System-description



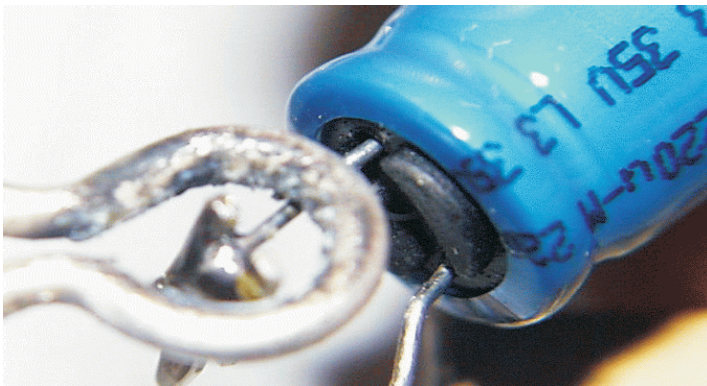
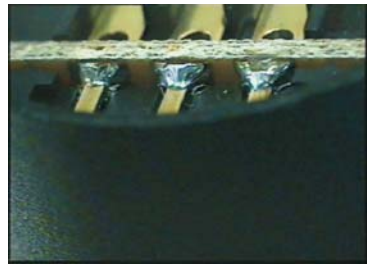
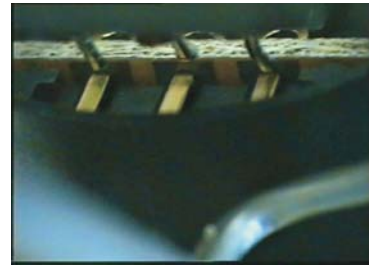
For induction-soldering systems the following components are necessary:

- Inductor
- Solid-state high-frequency power unit
- Cooling system
- Process control with operator panel
- Solder wire feeding unit (if necessary)
- Custom made fixtures for the workpieces
- Infrared temperature sensor (if necessary)

## Application

Induction soldering can be applied if the following requirements can be fulfilled::

- It must be possible to lead the inductor around the solder spot
- The parts to be soldered should be quite massive (not very thin wires or small circuits on PCB's)
- Electronic components near the inductor can be damaged through induced currents.
- The position tolerances of the parts to be soldered should be limited. The solder wire must hit the solder spot precisely to be melted exactly at the right spot.



## Advantages

... Compared to iron-soldering

- + Fast and contact-free heat transfer
- + Constant energy input to solder spot
- + No wear of the solder tip

... Compared to flame-soldering

- + The flux does not get burned during soldering
- + Constant energy input (Temperatur and energy density of the flame is not as constant)
- + The safety requirements are much lower

## Maschinen

Induction-soldering systems can be fully automatic machines with "in-line-workpiece flow" or semi automatic work-places . In both cases the Wolf - Standard-Cell (see product information on "Production-Modules")

Depending on the specific solder task induction soldering machines are designed individually and can look very different.

What they all have in common is:

- Most machine componets are maintenance-free
- The machines are modular
- They have a sturdy structure together with the Wolf typical design.

- I- Only high precision-programmable axis are used.
- A solder fume extraction is integrated
- If necessary the solder spot can "covered" with nitrogen gas.
- The process-controller is very comfortable, which makes it easy to set up the perfect solder process
- All important solder parameters are continuously monitored

## Machines

Induction-soldering-machines can be built as fully-automatic "In-Line"- systems as part of a transfer line or as a "Workplace-system". All systems are based on the Wolf-Standard-Cell (see separate product-information "Production-Modules").

Within a Standard-Cell several soldering-stations are possible. According to the specific requirements of the solder task, the machine can be custom-made.

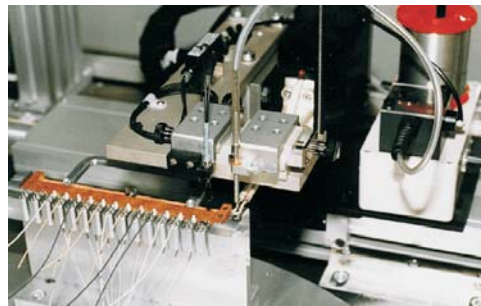
### Application 1



Info telegram to custom-made machine:

- Task: Connector with 3 pins in PCB
- Cycle-time: 6.0 s.
- In-Line-System: Parts are transported on workpiece carriers (pallets).
- Pre-heating of the parts through a halogen-lamp.
- Induction coil and solder wire feeding tube both moved by pneumatic slides.
- Man-machine-interface with text display And touch-panel.

### Application 2



Weitere Beispiele finden Sie auf unserer Website

Info telegram to custom-made machine:

- Product: Cable with connector (automotive)
- Cycle-time: 2.0 s per solder spot
- Manual handling of the parts
- Dial-index-table
- Safety light curtain
- Fixtures for 15 parts
- Induction-coil and solder-wire feeding tube on NC-Axe
- Man-machine-interface with text display And touch-panel.

**wolf**  
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**Special Soldering**

**Assembly  
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