



Scope of Services

- Technical advice and development
- Procurement and warehousing
- Tempering, component placement, soldering
- Milling, mounting, pressfit
- Inspection and testing
- Determination of error causes and reworking
- Customized manufacturing

Professional

Your competent and innovative partner for electronic assembly manufacture – from development, procurement and production, to repair.

Our company, Kraus Hardware GmbH, has three objectives:

1. to develop customized, highly-effective and profitable solutions.
2. to supply optimal and first-class quality on time
3. satisfied and loyal customers

We achieve these objectives by using state-of-the-art equipment and by having a highly motivated and qualified team.

Competence and Quality

– this is what Kraus Hardware stands for, your reliable service provider with experience in electronic development and manufacturing for many years. We customise your products and manufacturing processes. Your requirements will set the benchmark for us to act upon.



Easy to find us:

By road:
Use A3 or A45

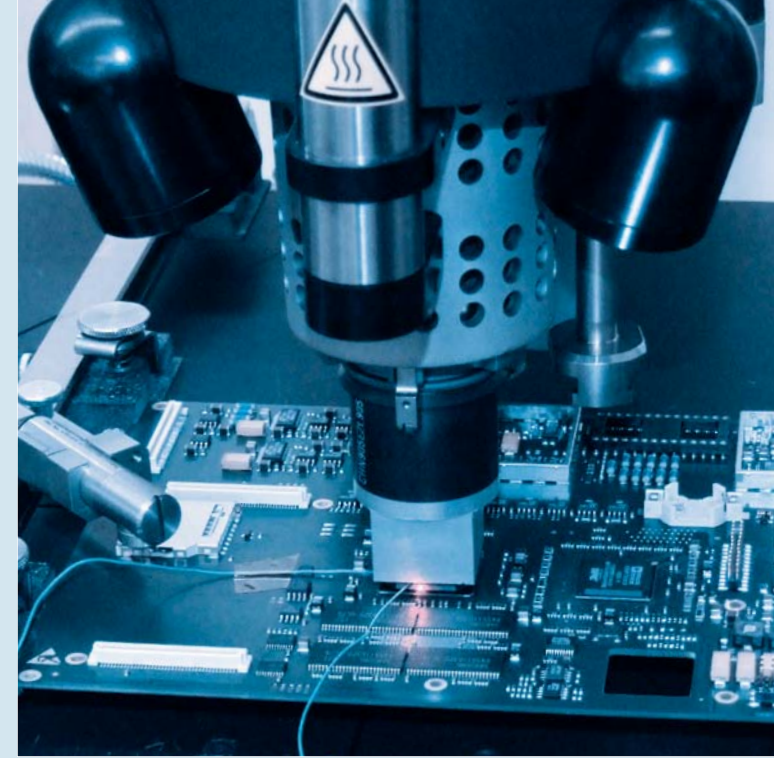
By rail:
Express (ICE) stations
Aschaffenburg, Hanau,
Darmstadt or local stations
Stockstadt (Main) and
Babenhausen (Hessen).

By air:
Airport Frankfurt/Main and
Airfield Großostheim



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Professional Reworking of Components



Your partner for innovative and fast solutions in electronic component manufacturing, from development, procurement, production, and also repair.

Reworking



We target the professional reworking of components.

Your valuable assemblies will be reworked with the utmost care.

With our innovative equipment and qualified staff we meet the highest requirements. We are attentive to our customers' requirements and accomplish highly-effective modification and repair of your assemblies.

The traceability system guarantees that the rework process is reproducible and fully documented.

Rework System ZEVAC ONYX 29



Performance data:

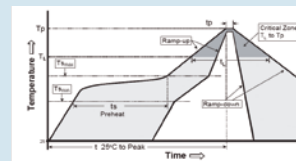
- Manufacturing of large assemblies
- Semi-automatic repair of assemblies
- Reproducible manufacturing process
- Contact-free solder cleaning system
- Vision system with split optics
- Various Temperature monitoring capabilities
- Traceability

Applications:

- Exchange or rework of inaccurately placed, damaged or false components
- Finding solutions for component failures
- Subsequent placement of components
- Dispensing of solder paste, adhesives, filling compounds etc.
- BGA reballing

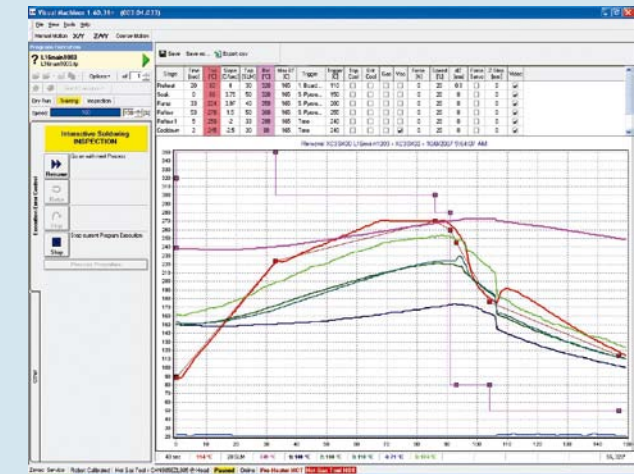
Compliance with Regulations

- IPC Norm
- Tempering of components and assemblies
- Thermal stress of assemblies

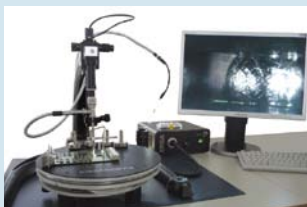
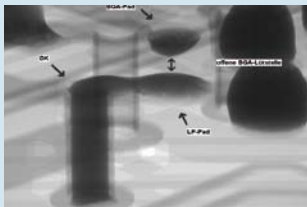
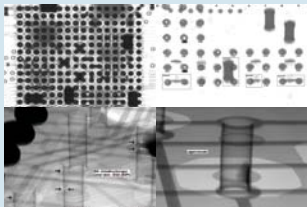


Process Evaluation

- Temperature measurement with thermocouples
- Non-contact temperature measurement at assemblies and components with infrared sensor and pyrometer
- Visual control with live image camera
- Covering and protection of heat-sensitive components
- Allowing for component-related processing data



Determining Error Causes



- X-ray analysis with highest resolution and oblique view at a detector angle from 0° to 70°.
- What can be reworked?
 - Solder bridges (short circuit)
 - Open solder joints
 - Contraction cavities
 - Solder migration
- What cannot be reworked?
 - Through plating cracks
 - Layer misalignments
- Endoscopy of gaps up to $\leq 50 \mu\text{m}$
- Plan view imaging
- Metal halide lamp with various lighting capabilities

Tempering Oven

- Through the use of a tempering oven we avoid delamination of BGAs, complex multi-layer PCBs, flexible and rigid-flex PCB assemblies.
- Program-controlled and monitored temperature profile
- The tempering oven is used for components and PCBs susceptible to moisture.

