



TQ-Manufacturing

Overview of locations



Headquarter Delling



SMT - 3 x SMT production lines

- SAKI SPI & AOI systems for internal process control
- ASM pick & place machines
- DEK solder paste printing machines
- REHM reflow oven

THT - 2 x SEHO lead-free & leaded

2 x ERSA Selective Soldering System lead-free & leaded

Testing field - ICT-Systems, SPEA Flying Probe Tester, robot automated project related function tester

Varnishing

Assembly - project relates assembly lines using lean methods

Location Durach

SMT - 4 x SMT production lines

- SAKI SPI & AOI systems for internal process control
- ASM pick & place machines
- DEK solder paste printing machines
- REHM reflow oven

THT - 1 x ERSA lead-free

1 x ERSA Selective Soldering System lead-free

Testing field - ICT-Systems, SPEA Flying Probe Tester, robot automated project related function tester

Varnishing

Assembly - project relates assembly lines using lean methods



Location Peiting

SMT - 2 x SMT production lines

- SAKI SPI & AOI systems for internal process control
- ASM pick & place machines
- DEK solder paste printing machines
- REHM reflow oven

THT - 2 x SEHO lead-free

1 x ERSA Selective Soldering System lead-free

Testing field - ICT-Systems, SPEA Flying Probe Tester, robot automated project related function tester

Varnishing

Assembly - project relates assembly lines using lean methods



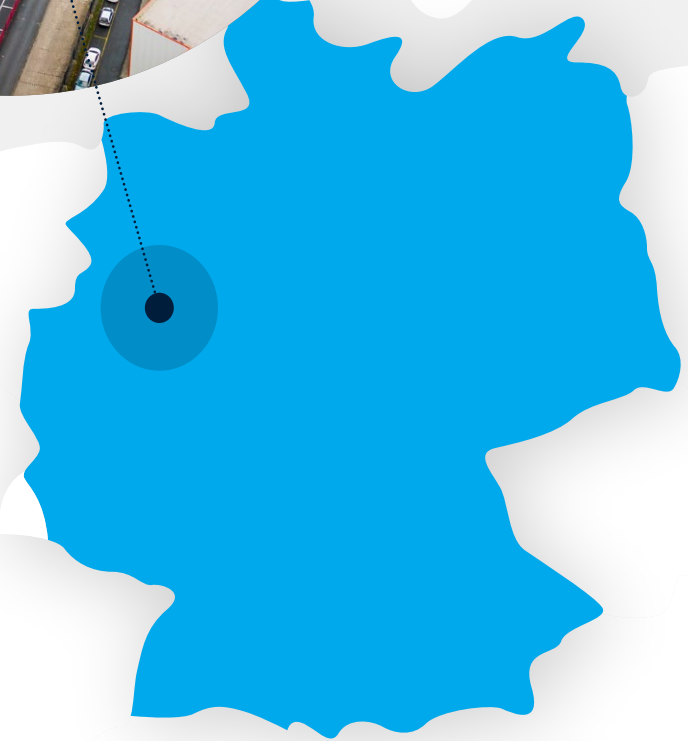
Location Inning

Assembly

- fully automated assembly lines
- winding of stators
- production of frameless motors
- automated final testing



Location Wetter (Ruhr)



SMT - 1 x SMT production line

- SAKI SPI & AOI systems for internal process control
- ASM pick & place machine
- DEK solder paste printing machine
- REHM reflow oven

THT - 1 x SEHO lead-free

Testing field - ICT-Systems, SPEA Flying Probe Tester, robot automated project related function tester

Assembly

- project relates assembly lines using lean methods
- cable manufacturing

Location Celje (Slovenia)

SMT - 3 x SMT production lines

- SPI & AOI systems for internal process control
- Panasonic pick & place machines
- DEK solder paste printing machines
- REHM reflow oven

THT - 2 x SEHO lead-free

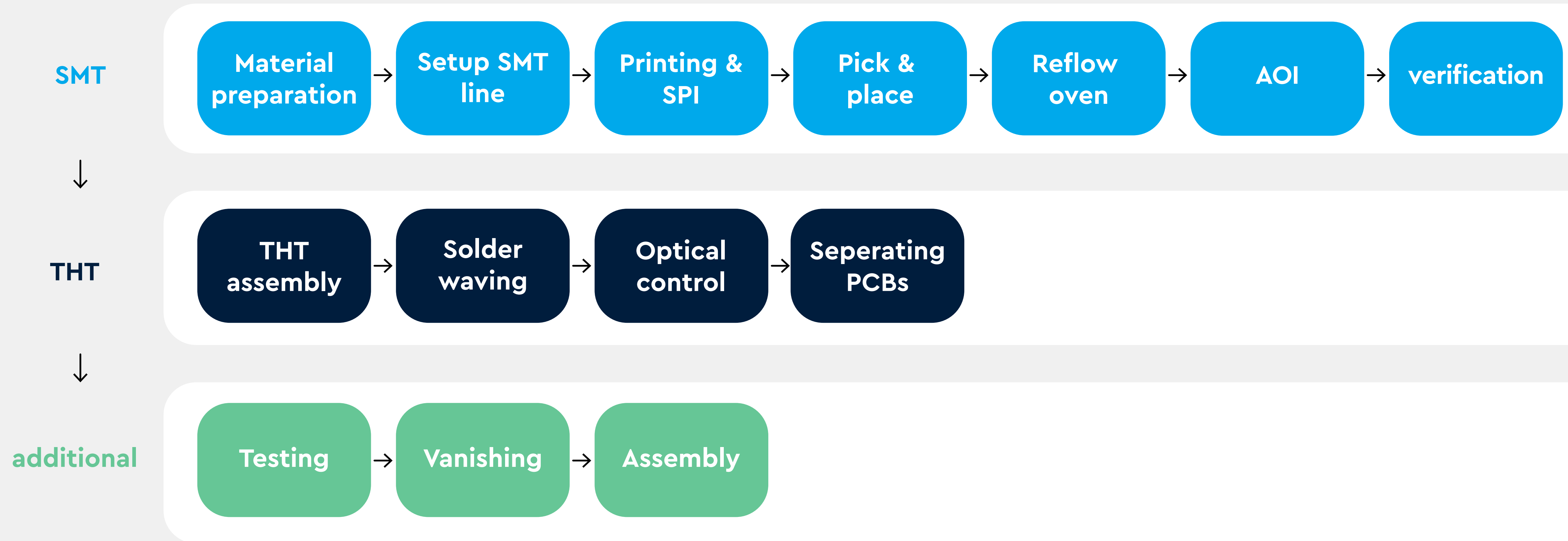
1 x SEHO Selective Soldering System lead-free

Testing field - robot automated project related
function tester

Varnishing



Process overview



The power of TQ-Manufacturing

- **EMS-specific self-developed MES system**
 - 100% traceability
 - Interlocking of operations if previous operation not booked or fail
 - Paperless production
 - Derivation of key figures and andon boards for live monitoring
- **AOI systems**
 - Close and long-term partnership with SAKI to develop new software solutions
 - Self-developed THT AOI to calculate solder joints = 100% implementation of IPC requirements
- Automated processes: automated FKT testers, flying probe
- Inhouse training center for new employees in the field of electronics production
- Harmonized equipment across all locations



Assembly structure as a core competence

- Automated processes (EM automatic line; automated gluing systems; HPR partial automation)
- Quantity 1 - 1,000,000
- High technical training of our production technicians for the implementation of complex products
- In-house automation team for the automation of assembly processes or sub-processes (critical processes in terms of low tolerances and repeatability)
- Lines set up in such a way that volume increases can be easily implemented (growth of our customers can be mapped)

Efficient production system through the use of lean and automation

- Focus on service concept (fast set-up of high-quality lines, flexible quantities, flexible employee qualification, efficient ramp-up management)
- Low-cost automation in-house thanks to simple solutions, even for small quantities / high flexibility



Waste-free production by integrating production into the TQ development process

- Identical parts
- Poka Yoke
- Design for automation
- Standardization of components and technologies
- Integration of TQ production from the kick off of a project up to SOP





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