Notion Systems GmbH
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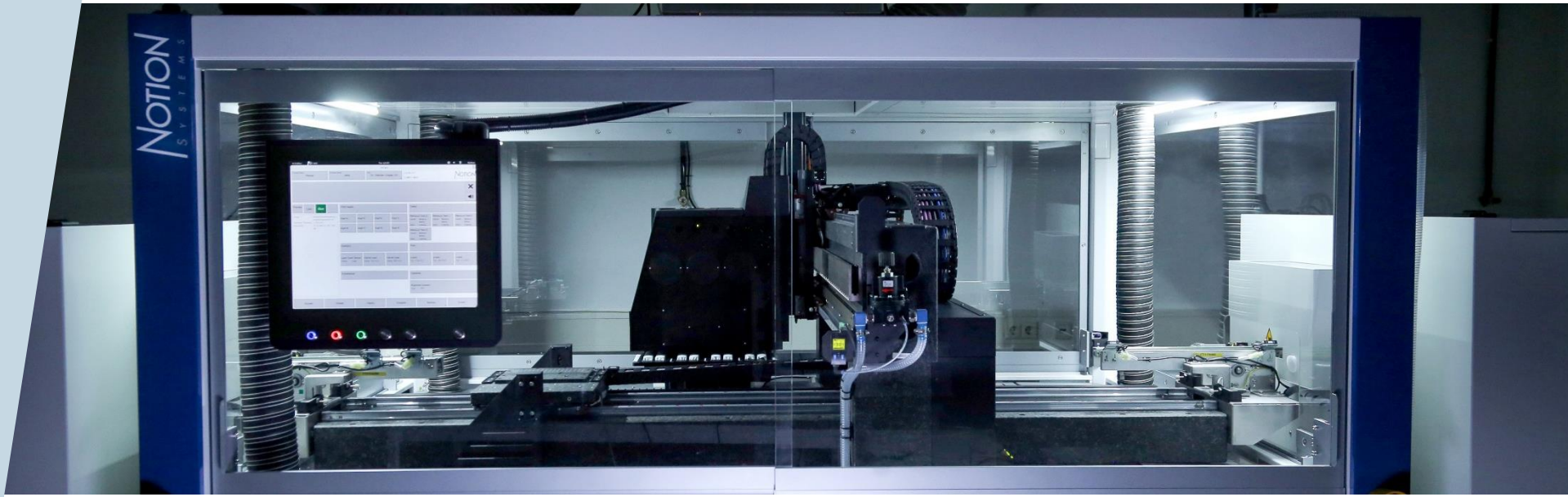
Germany

Inkjet · Laser · Automation

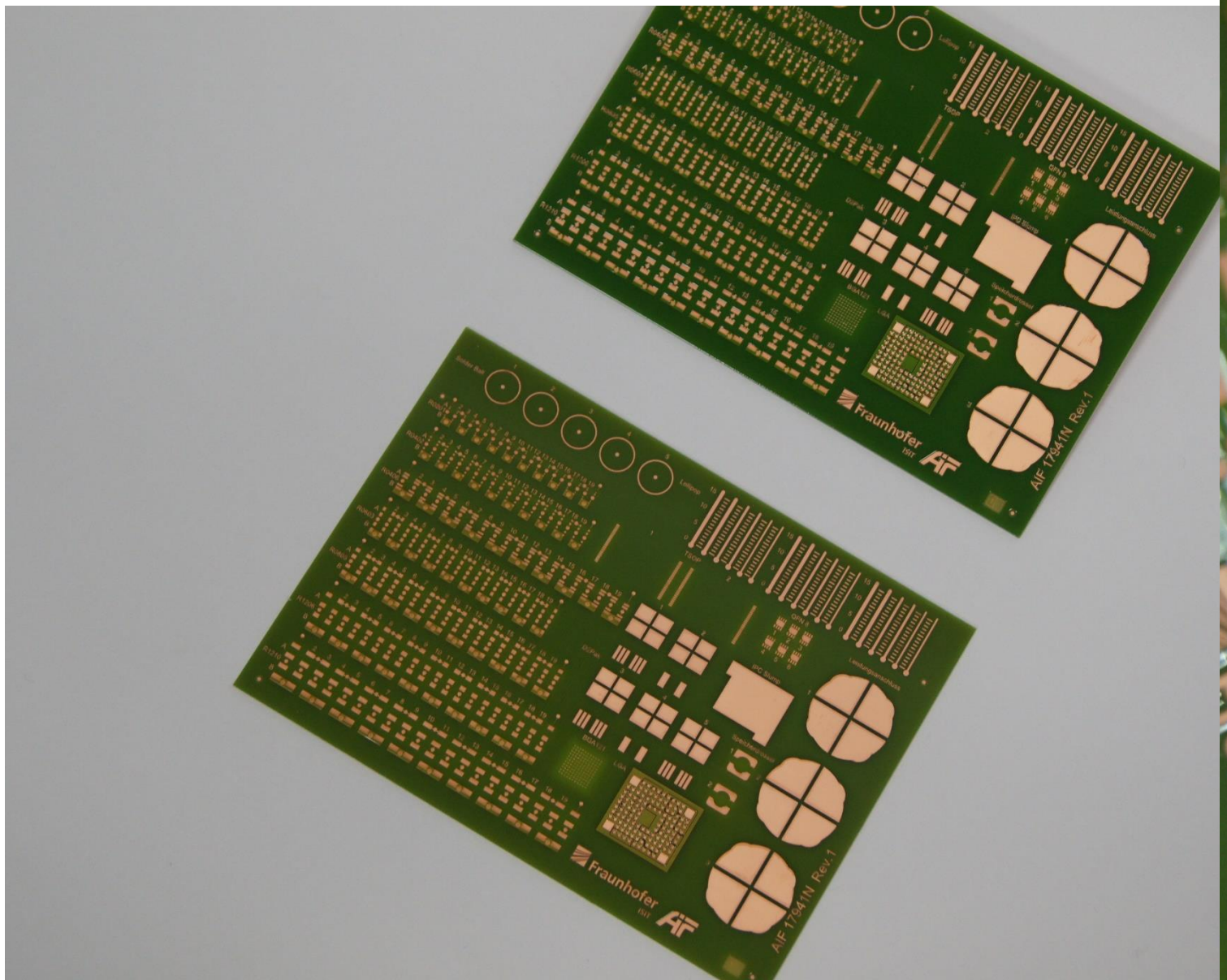


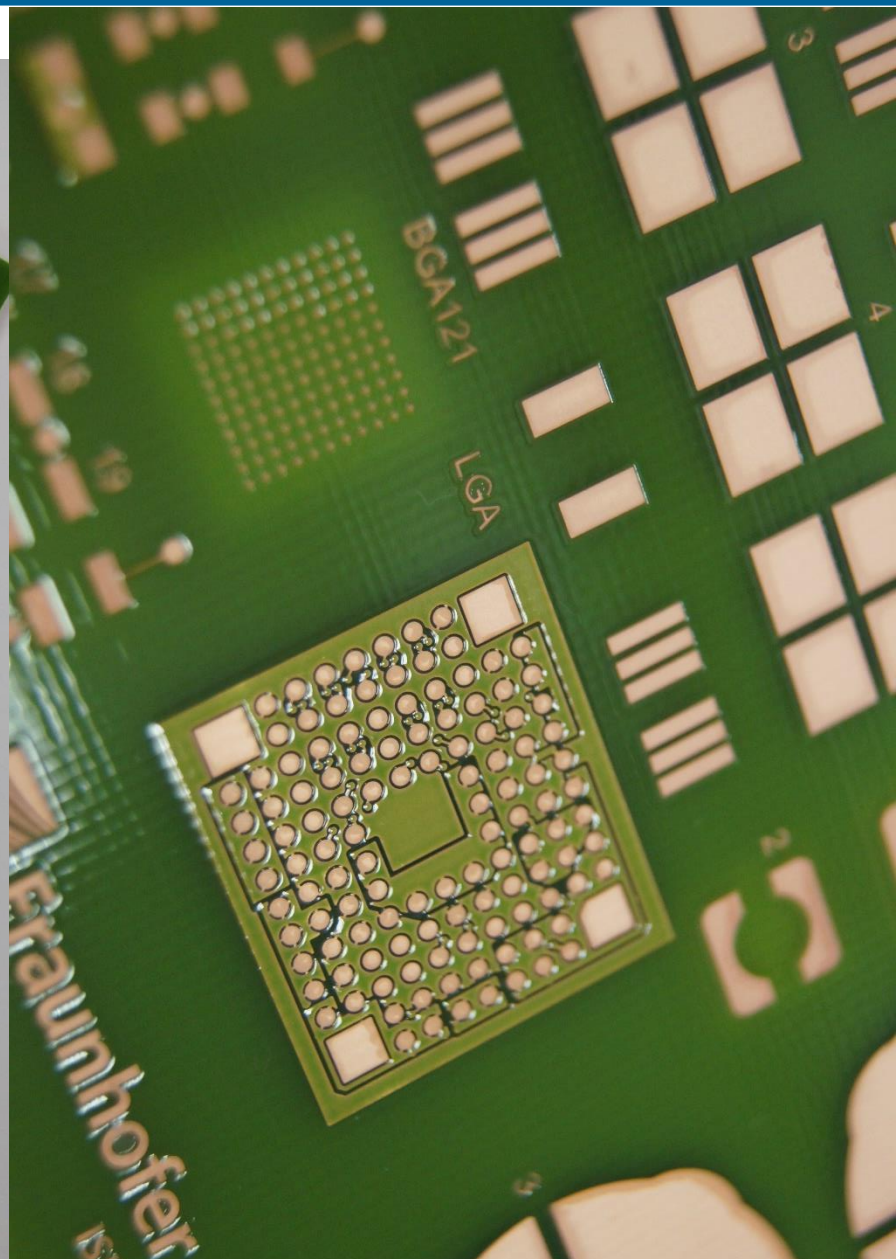
Notion Systems GmbH

Soldermask

Process & Equipment

Final products



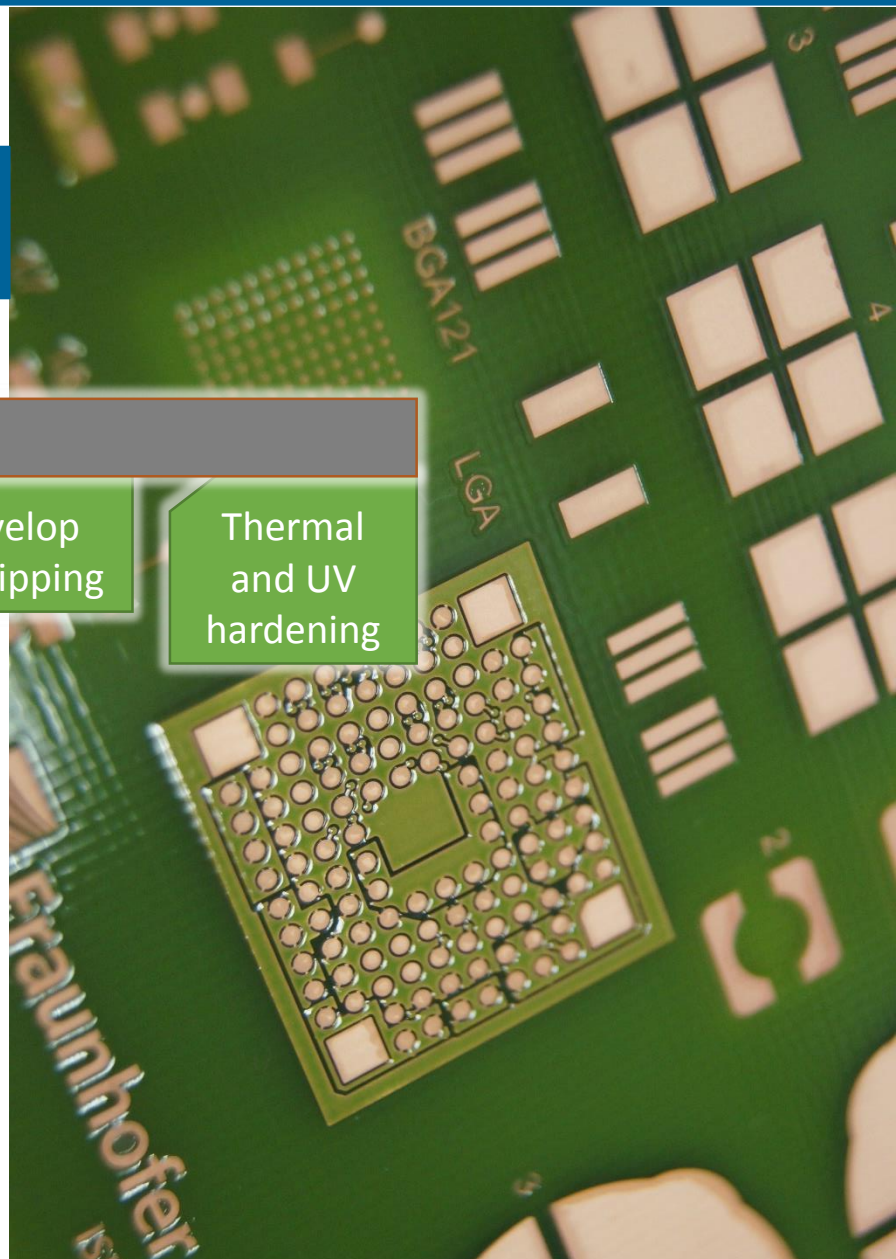


Today Established Process Steps

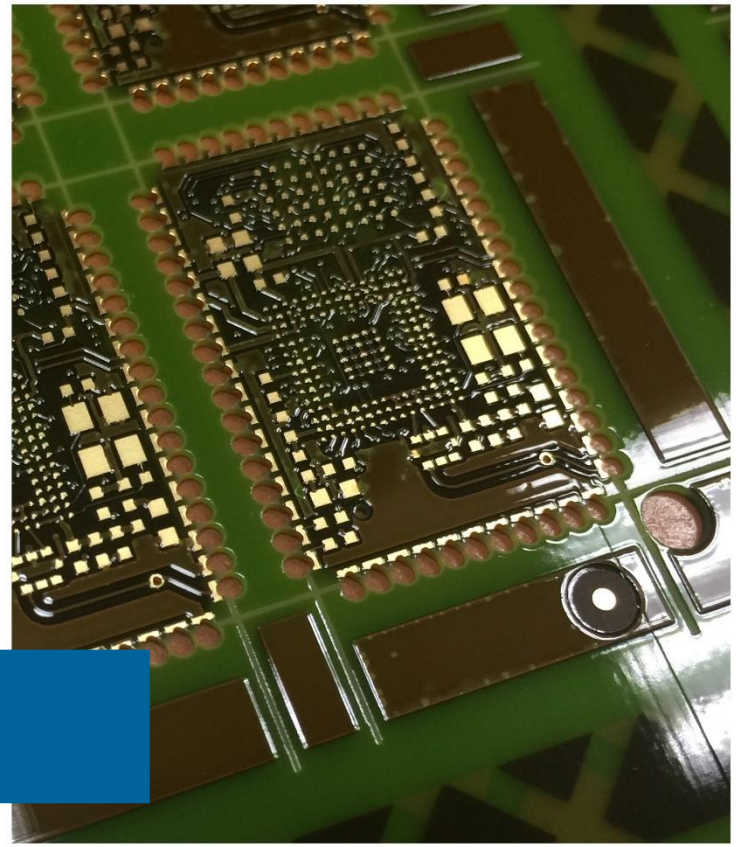
A line of process steps and systems

Solder Resist - Standard Process

- Curtain coating or spray
- Drying
- Photo-Mask
- Exposure
- Develop & stripping
- Thermal and UV hardening



The Revolution: Solder Mask by Inkjet



Only two process steps are required

Solder Resist - Inkjet Printing

- Resist printing
- Thermal and UV hardening

The Revolution: Solder Mask by Inkjet

Direct Comparison

Solder Resist - Standard Process

Curtain coating or spray | Dryi | Photo-Mask | Exposure | Develop & Strip | Thermal and UV hardening

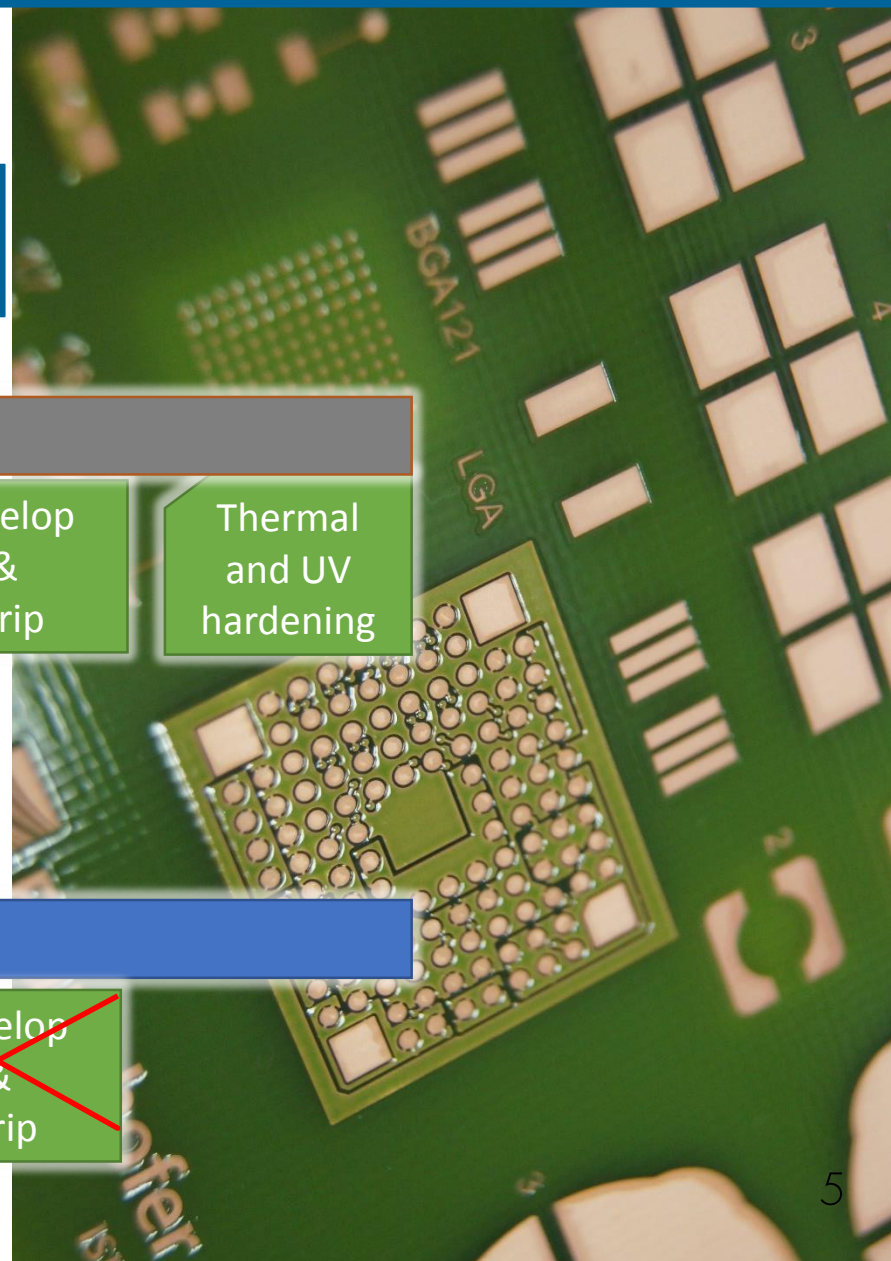
You save

5

Process-Steps

Solder Resist - Inkjet Printing

Resist Printing | ~~Dry~~ | ~~Photo mask printing~~ | ~~Photo Mask~~ | ~~Expo~~ | ~~Develop & Strip~~



… additional advantages

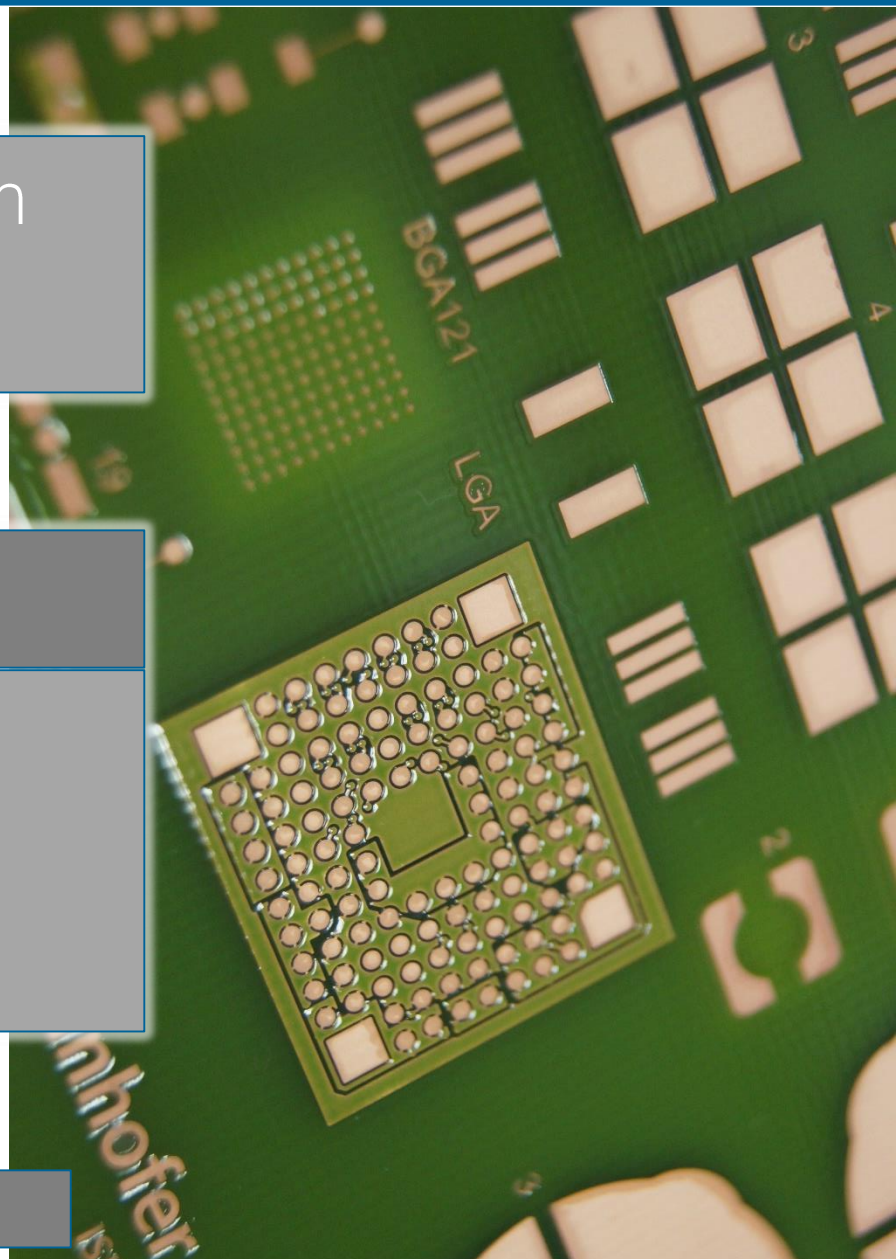
Reduction of electrical power consumption

140KW

Annual save of

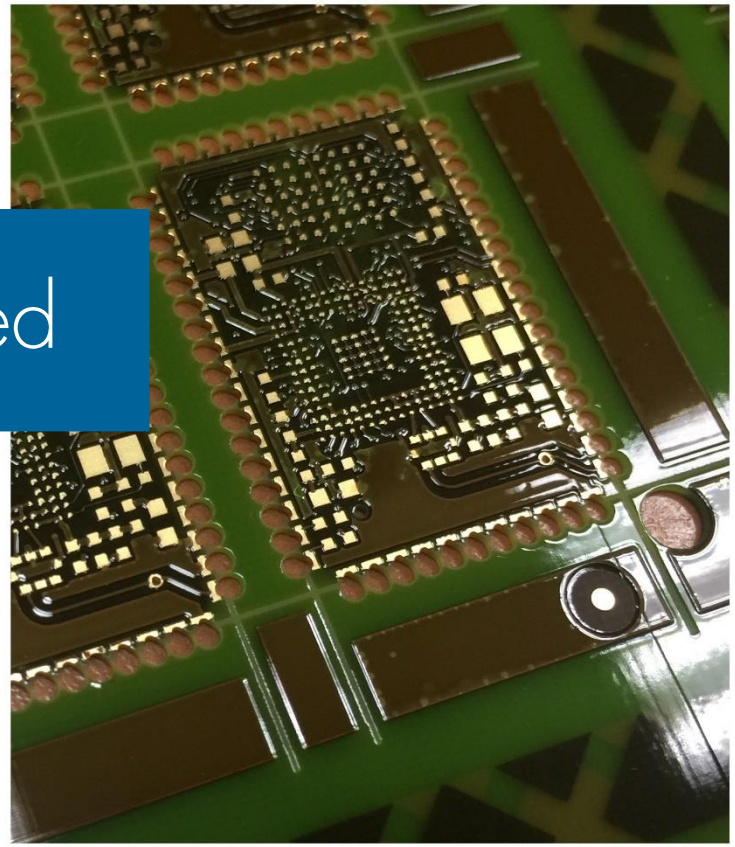
123.200€

Based on 0,25 €/ kWh



The Revolution: Solder Mask by Inkjet

Just print the solder mask where it is needed



- Print where it is required
- Reduce material costs
- Save floor space
- Reduce maintenance cost due to less process steps
- Protect your enviroment

… additional advantages

Define your surface reflexion level

By changing the printing strategy you can easily adapt the shininess of your PCB to customer requirements

Inkjet – another Advantage

further advantages

- „bump" – profile
  - less stress at contact surface
- height locally adaptable
  - less stress for assembled components

Our concept and other PCB applications

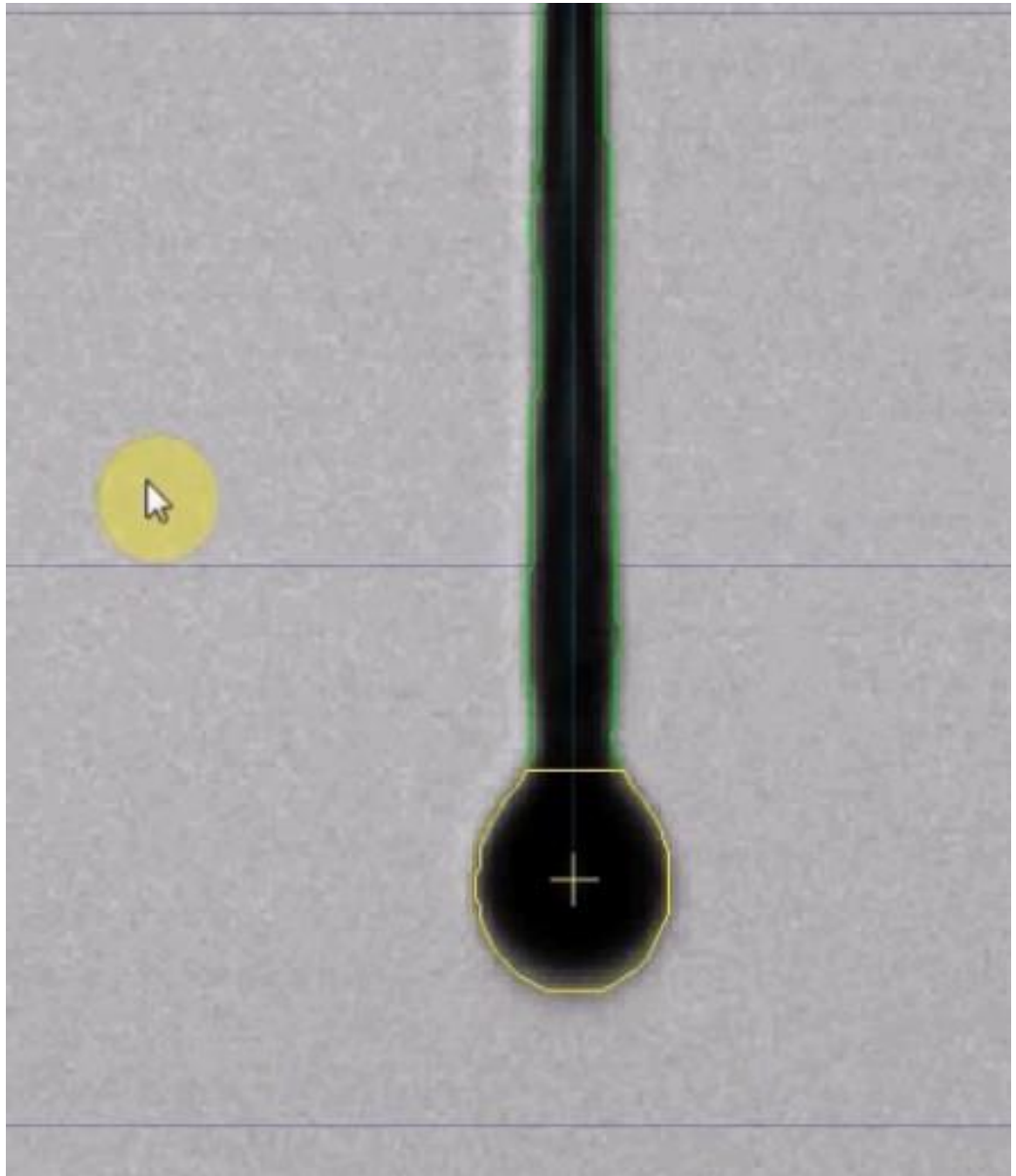
Modular Process Unit

- Five functional slots, configurable individually (more on request)
- Large variety of process modules and applications
  - Inkjet print heads of various manufacturers
  - Solder mask printing
  - Legend printing
  - Hot melt printing for etch resist
  - Metal seed layer printing for CU plating
  - Alignment- and inspection cameras
  - UV pinning
- Easy change by operator

Optimize your throughput

Modular Process Unit

- Adapt the numbers of print heads to achieve optimized throughput
- Speed up to 40 sek./panel side
- Solder mask and legend print as "wet in wet" process to improve adhesion of legend ink.
- Easy change of print heads by operator

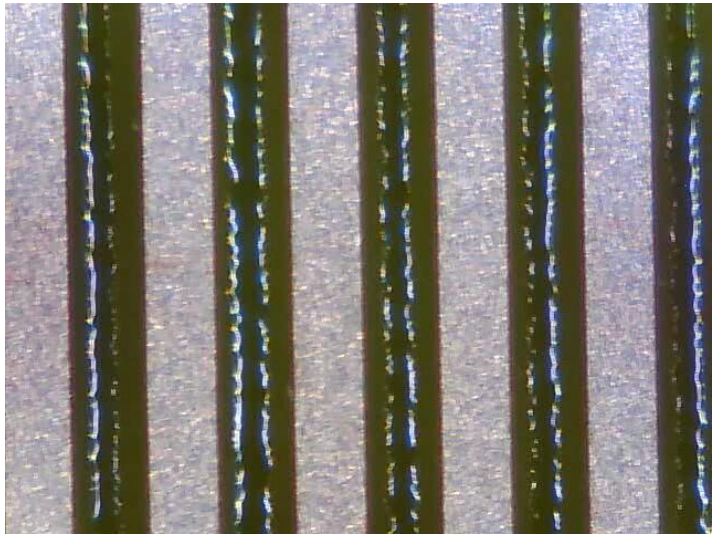


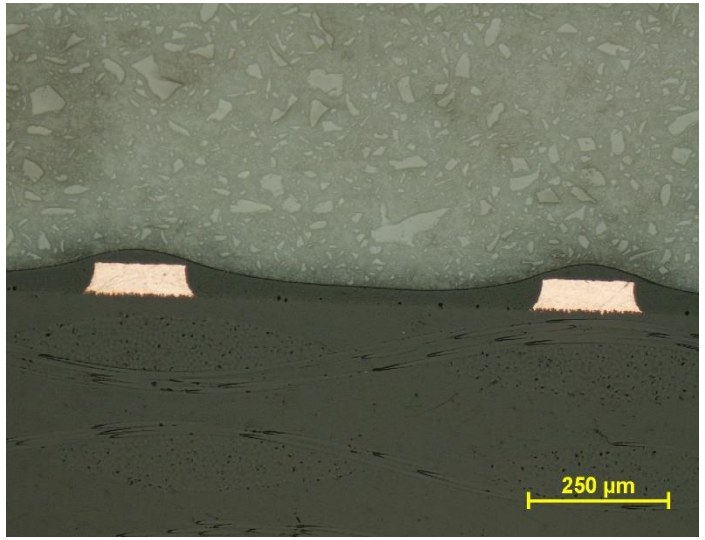
Integrated Drop Watcher (optional)

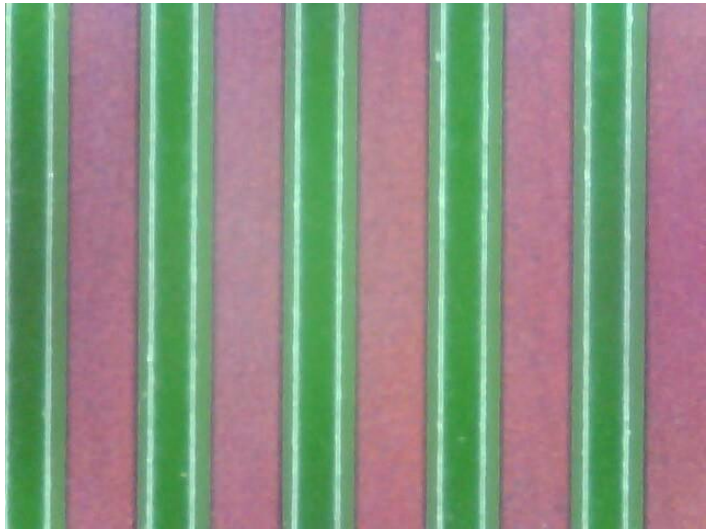
- Drop Watcher integrated
- High resolution camera (1µm/pixel)
- Real time drop watching
- Monitoring of:
  - Main drop volume
  - Satellites volume
  - Drop velocity
  - Droplet angle

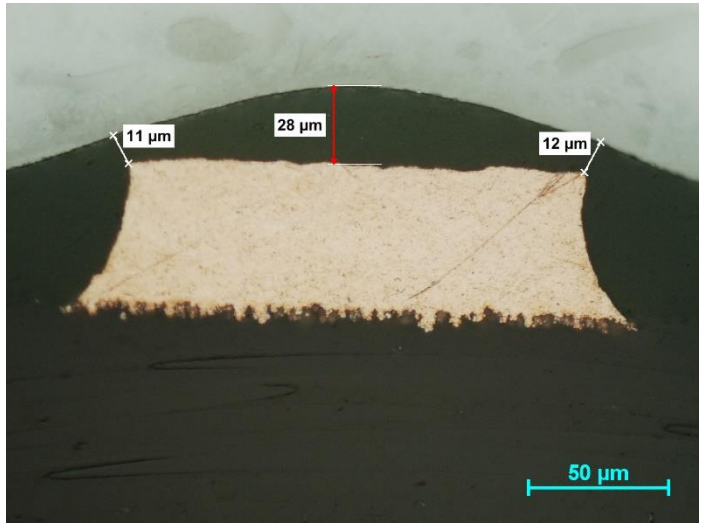
This feature eases the implementation of multiple inks or when you want to use new Solder Mask Ink supplier.

n.jet pcb features



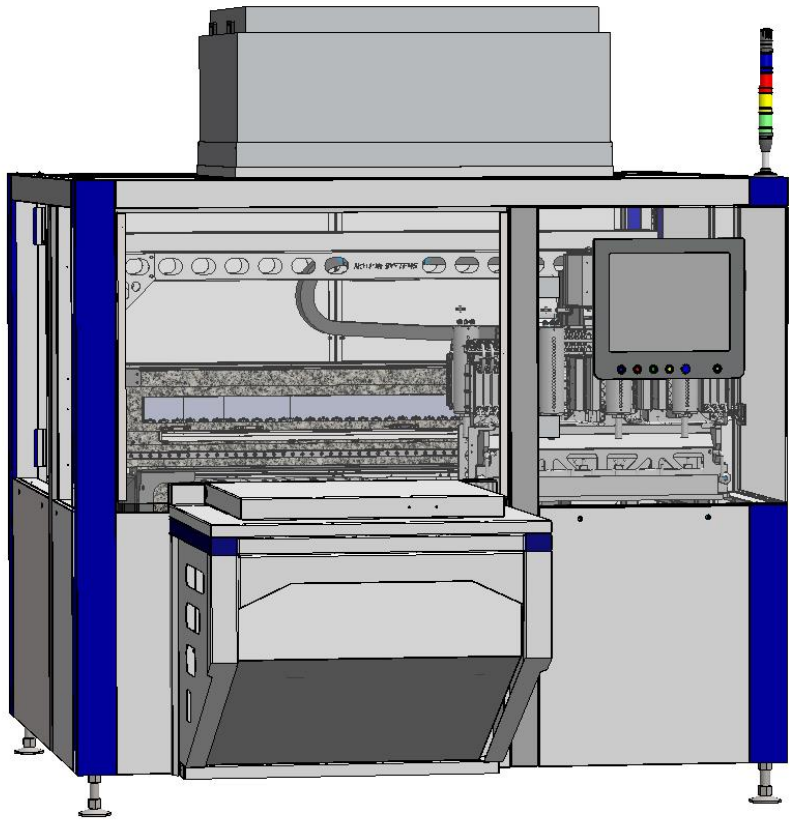






Solder Mask Ink and printing results fullfill the requirements of IPC standards and automotive industry.

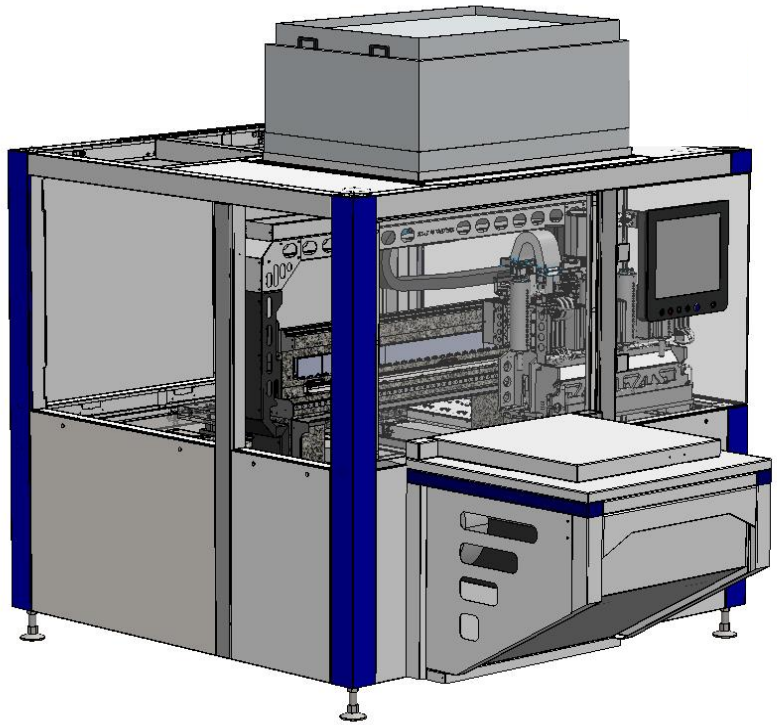
All electrical and long term tests passed successfully



System specifications

- Size: 1800 x 2000 x 1900 mm (WxLxH)
- Weight: approx. 3000 kg
- Machine Base: granit on air bearing
- Power: ≤ 10 kW
- Vacuum Table: 650 x 650 mm
- Substrate: max. 610 x 610 mm (larger as option)
- Thickness: max. 35 mm
- Table accuracy: ± 3µm
- Repeatability: ± 1µm @ 3 sigma
- Table Speed: max. 1000 mm/sec

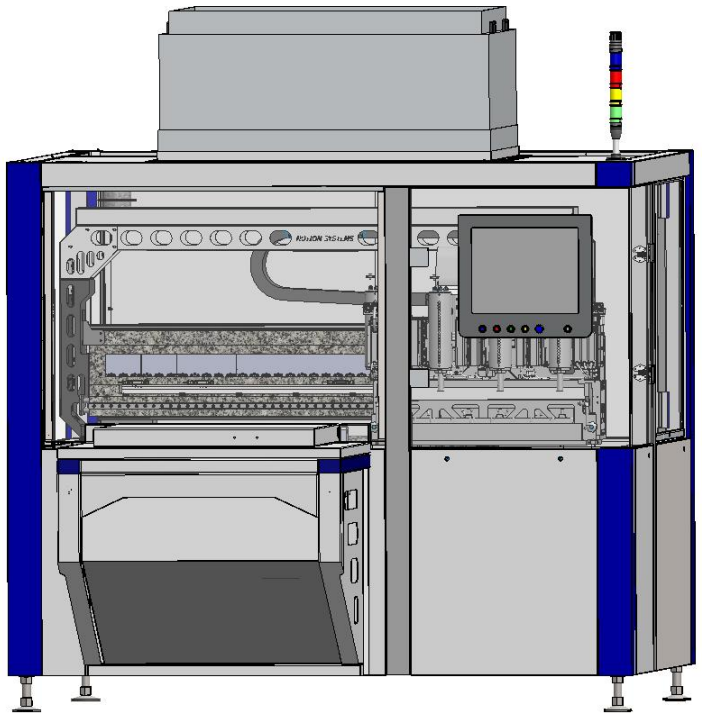
n.jet pcb features



System specifications

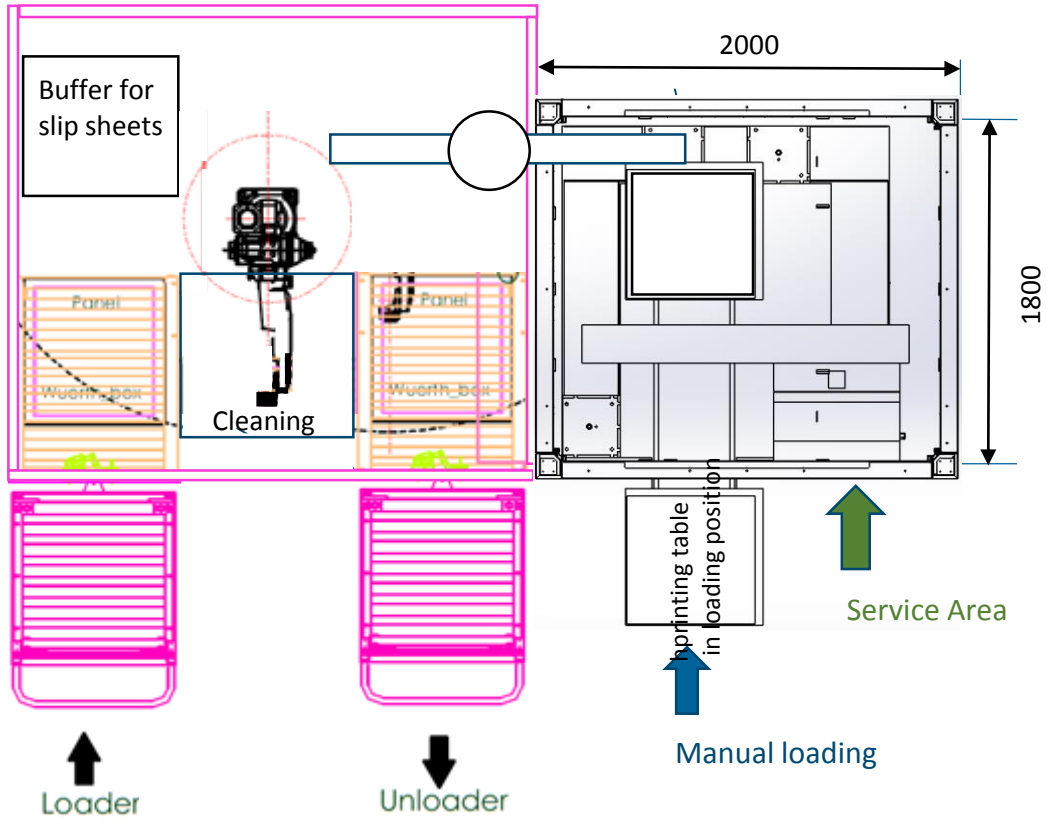
- Print head: Konica Minolta KM1024i
- Reservoir: 150ml, 600 ml (optinal automatic refill)
- Head Exchange: pre adjusted heads for fast replacement.
- Print Resolution: adjustable; n x 360 dpi
- Repeatability : 1µm
- Print Accuracy: ± 15µm
- Print Heads: max. 9 PH`s; (various manufactures possible)

n.jet pcb features



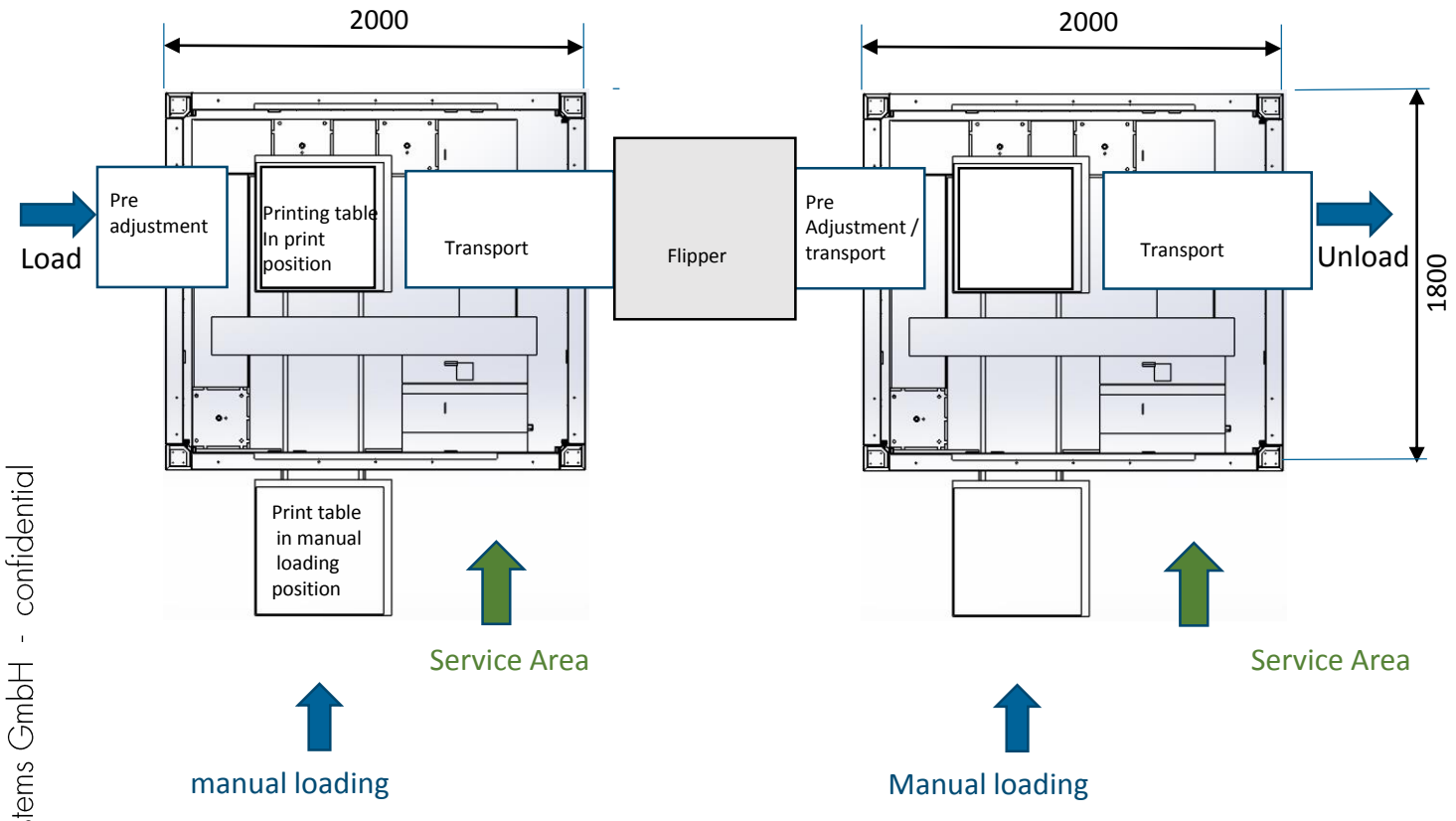
System specifications

- Alignment: 1µm accuracy
- UV curing: 20 W/cm² for solder mask
- Data formats: Gerber, ODB ++, Bitmap
- Print head: Konica Minolta KM1024i
- Cycle time : 1Layer, no legend 37sec
- 1 layer, plus legend 55 sec
- GUI: graphical user interface with touch screen



Loading and Unloading parallel to InkJet printer

- Automation with standard robot system (6-Axe / 3-Axe)
- Load / Unload via dockable carts
- Horizontal and semi vertical cassettes possible
- Cleaning and pre adjustment unit (on request)
- Free access for manual PCB handling
- Easy access to service area reduces maintenance costs



Load- and unload in linear arrangement

- Load / Unload via belts
  - Transfer belts between load and unload position and print table
  - Transfer belts between print table and and flipper
- Linear axes / 3 axe robot with gripper between transfer belt and print table.
- Prealignment before transfer to print table
- Automation (Load / Unload) with standard automation (optional)
- Inline processing is possible
- Free access to manual loading positions
- Easy and free access to the service area.

Projekt-Entwicklung

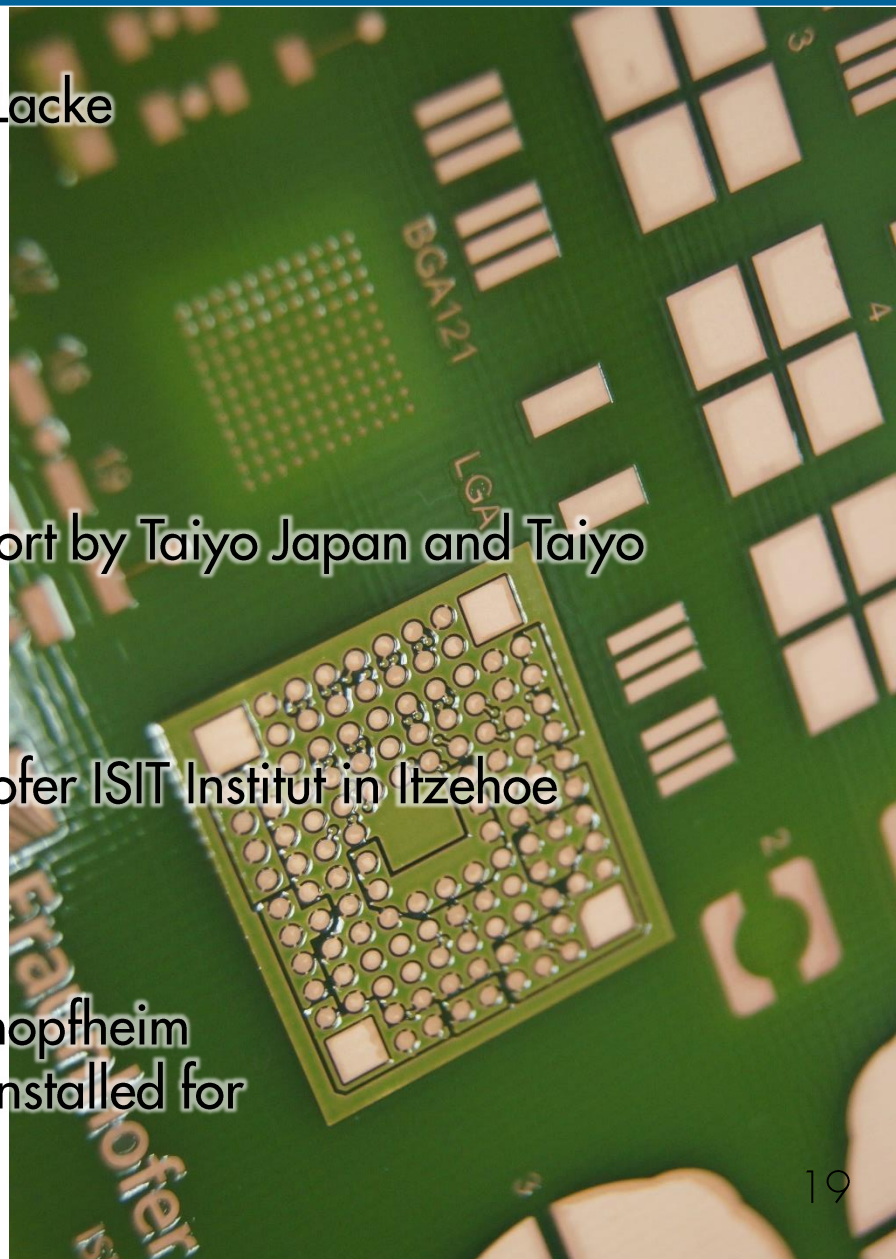
Q1/14 Prelimanary talk to Sun Chemical, Dow Chemical, Peters Lacke

Q2/14 Selection of Taiyo at JPCAExhibition 2014 in Tokyo

Q1/15 Process development at ZIM-Project, Process support by Taiyo Japan and Taiyo America (Jan 2015 until Dec 2016)

Q3/15 Evaluation of inkjet printed circuits by Fraunhofer ISIT Institut in Itzehoe mentioning other positive side effects

Q4/15 Cooperation with Würth Elektronik in Schopfheim
Since March 2016 Notion InkJet system installed for qualification and preproduction



Thank you for your attention
We exceed expectations