

**Systems for  
void-free soldering  
with vacuum**





## A company with competence in vacuum technology

### Focused on the requirements of international customers

PINK GmbH Thermosysteme – founded by Friedrich Pink – is located in Wertheim/Main and has about 160 employees now. The product range includes systems for vacuum-supported soldering, sintering modules and systems, low-pressure plasma systems for surface treatment as well as systems for drying and processing technology.

In the past years, the family business PINK has grown steadily and successfully due to continuous product improvements and consequent customer orientation. PINK operates internationally with a network of sectoral agencies in all major markets and is a worldwide supplier of customized plants and systems.

Well-known technology companies of e.g. automotive industry and their suppliers, semiconductor industry, electronics industry as well as chemical and pharmaceutical industry rely on the qualitative and innovative products of the company.



## Vacuum-soldering for high-quality production

The power density of advanced electronic components like e.g. power modules, hybrid and multichip components, etc. is continuously growing. Therefore, the quality of solder connections must fulfill the increasing demands as well. Gas inclusions (= voids) in the solder connections must be avoided.

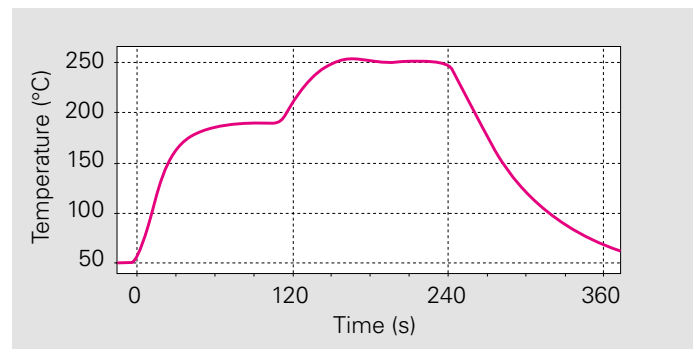
The best way to remove such from the liquid solder is the systematic use of vacuum during the soldering process.

The vacuum soldering systems by PINK provide void-free solder connections, e.g. of large power modules, with preform solders and/or pastes in a continuous process.

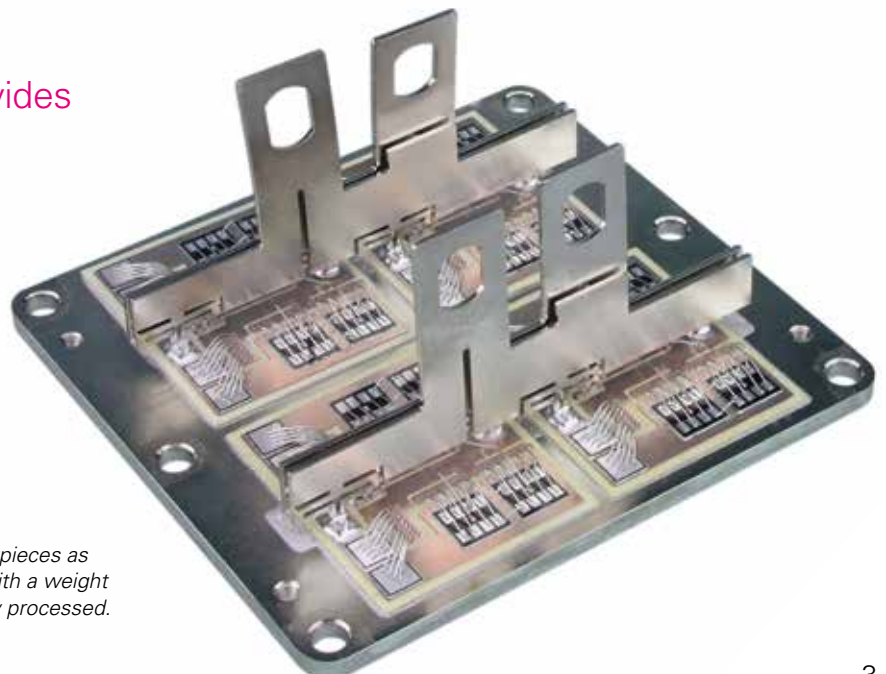
## Areas of application

- Semiconductor industry
- Power electronics
- Automotive industry
- Optical and electro-optical industry
- High frequency technology
- Wafer technology
- Rail drive technology
- Solar technology
- Wind power station technology

## Typical soldering profile for lead-free solders



»The vacuum-supported soldering process by PINK provides void-free solder connections.«



*Even high mass workpieces as this power module with a weight of 1,000 g are reliably processed.*

## Advantages of the VADUs

### Short cycle times and high performance by intelligent temperature management

The VADU systems have a short heating and cooling time with controlled gradients and a process temperature of up to 400 °C. In addition, temperature stability is secured during evacuation.

The substrate temperature is continuously monitored and controlled with an intelligent temperature regulation contacting the docking heating and cooling plate. This technology provides optimum soldering processes with short cycle times, fast soldering results and high performance.

### Flexible soldering technologies for individual customer demands

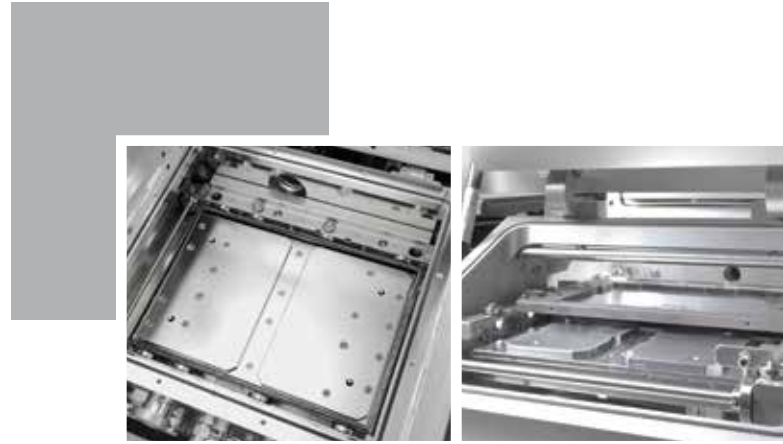
PINK offers soldering systems suitable for each production strategy: VADU 100 for laboratory or batch production, VADU 200 for batch operation or VADU 300 and VADU 400 as automated inline systems for series production.

Each vacuum soldering system for preform and/or paste soldering under an inert soldering atmosphere can be equipped according to individual customer requirements with different customized options like e.g. formic acid equipment, transfer systems, handling equipment, etc.

### Environment-friendly and easy to operate due to a smart design

Based on the compact design, the VADU soldering systems require a minimum of space and energy and are both economically and ecologically efficient during a 24/7 operation.

The ergonomic design of the VADU also provides advantages with regard to operation, service and maintenance due to an easy and quick access to the chambers.



View into the process chambers of VADU soldering systems.

### Perfect and reproducible soldering results due to a continuous process control

All systems of the VADU series provide an individual definition as well as control and monitoring of the soldering profiles due to permanent product tracking and process control.

All process data can be tracked at any time due to a permanent parameterization during the soldering process. Therefore, reproducibility of the soldering processes is guaranteed and a constant high product quality is assured.

### System features

- Void-free solder connections
- Soldering with preforms and/or pastes
- Individual soldering profiles
- Process temperatures up to 400 °C
- Controlled temperature gradients
- Short cycle times
- Separate soldering and cooling chamber or zones
- Formic acid process for flux-free soldering
- Flux management
- Inert gas atmosphere
- Residual oxygen content < 5 ppm
- Reproducibility of the soldering results
- Traceability
- Permanent process control
- Ethernet interface
- Remote maintenance (VPN)
- Low energy and media consumption



**VADU 100**

**VADU 200 XL**

**VADU 300 XL**

**VADU 400 XL**

Type of system	Batch system	Batch system	Inline system	Inline system
Number of vacuum chambers	1 chamber with 2 separate process zones	2 chambers	3 chambers	4 chambers
Process area (W x D)	168 x 280 mm	410 x 280 mm	410 x 280 mm	410 x 280 mm
Clearance height	max. 50 mm	max. 100 mm	max. 100 mm	max. 100 mm
Vacuum (standard)	≤ 2 mbar	≤ 2 mbar	≤ 2 mbar	≤ 2 mbar
Dimensions of the system (W x D x H)	1,070 x 1,130 x 1,150 mm	1,200 x 1,890 x 1,680 mm	2,410 x 1,610 x 1,800 mm	3,020 x 1,660 x 1,800 mm
Dimensions of pumping unit	Integrated	Integrated	990 x 690 x 1,800 mm	990 x 1,290 x 1,800 mm
Weight (approx.)	500 kg	1,200 kg	2,000 kg (without pumping unit)	2,600 kg (without pumping unit)
Power supply	3 x 400 V, 50/60 Hz	3 x 400 V, 50/60 Hz	3 x 400 V, 50/60 Hz	3 x 400 V, 50/60 Hz
Power input	5 kVA	10 kVA	25 kVA	35 kVA
SMEMA interface	—	—	✓	✓

**Options:**

Alternative process areas (W x D)	—	420 x 320 mm (W version)	600 x 280 mm (XXL version)*	600 x 280 mm (XXL version)*
Wafer	up to 6 "	up to 12 "	up to 12 "	up to 12 "
Process temp. up to 500 °C	✓	✓	✓	✓
Induction heating	✓	✓	✓	✓
Handling-/ Transfer systems	✓	✓	✓	✓
High vacuum	✓	✓	✓	✓
MES interfaces (e.g. SECS/GEM)	✓	✓	✓	✓

\* this will change the dimensions of the system

## Fully automated soldering with vacuum in series production

### Automation solutions by PINK

The integration of soldering systems into existing or newly developed production lines are individually designed and produced by PINK with particular focus on customer's automation processes.

The requirements of the customers range from the optimization of the carrier handling through surrounding transfer systems to link-up with pick-and-place machines and robot automation.

The continuous collection of process data guarantee reproducibility, product quality and process reliability for all systems.



*VADU300XXL with surrounding transfer system.*

»The VADU can be optimally integrated into customer's automation processes.«



*VADU300XL with robot system and integrated lifting units as well as underfloor return transport.*

## A suitable solution for each customer's requirement



*Carrier with integrated downholder frame for automatic fixture in the process chamber.*

### Carriers for maximum productivity and cost-efficiency

PINK develops and manufactures customized, substrate-specific carriers and base plates in close cooperation with the users.

Both carriers with manual attachment (for high variant flexibility in production) as well as carriers with automatic fixture within the process chamber (for fully automatic high-throughput operation) are available for the VADU system.

### Selection criteria

- Desired degree of automation
- Workpiece geometries and soldering process
- Necessary option flexibility



*Carrier with downholder frame for master cards and special applications.*



*Carrier for wafer.*



*Carrier with fixtures for soldering of connecting contacts.*



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**Fields of competence**

Soldering technology  
Sintering technology  
Drying technology  
Plasma technology