

- Special Soldering
- Laser Processing
- Assembly Automation

The Company

The philosophy

Wolf Produktionssysteme was founded in 1988 by the owner Dr.-Ing. Ernst Wolf. His aim: To implement the expertise and ideas he had acquired at the Fraunhofer Institute for Production Technology and Automation in the practice. Today, Wolf Produktionssysteme develops and manufactures special-purpose machines with a workforce of over 80. Our customers typically work in the fields of:

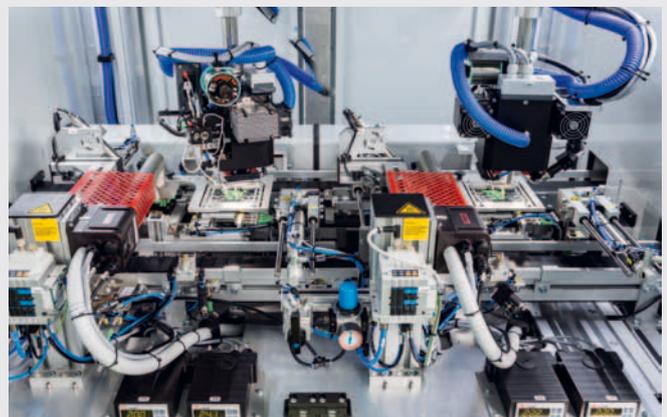
- Electronics industry
- Medical technology or are
- Suppliers to the automotive industry.

The machine range focuses on three main areas:

- Special soldering technology
- Laser processing and
- Assembly automation.

Wolf assembly lines encompass the company's "own" processes, such as soldering or laser processing. All steps from project processing to final assembly take place in-house. Some may think the vertical range of manufacture is too large but, in fact, this is the only way to guarantee a consistently high standard of:

- Quality
- Flexibility
- Planning reliability and
- Cost control.





Process orientation

Wolf Produktionssysteme not only builds machines but sees itself as a process specialist. The aim: Fast, trouble-free execution of complex processes in production systems and machines. The Wolf Technology Centre supports customers throughout every phase of process development.

Standardization

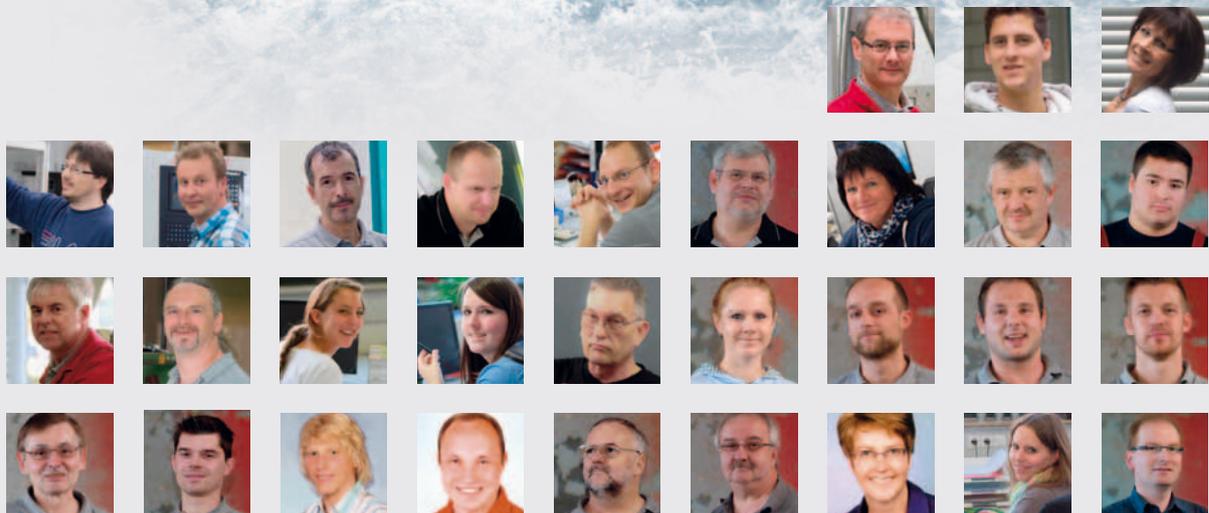
The primary aim is to produce production systems and machines to the highest achievable standard of quality. To achieve this aim, the machine range has undergone a fundamental and consistent program of standardization based on modular technology. The result: Wolf's own automation platform "Skyline". Today, this platform is exclusively used as a basis for all Wolf machines. Alongside improved efficiency in the manufacture of machines, this guarantees a consistently high standard of quality.

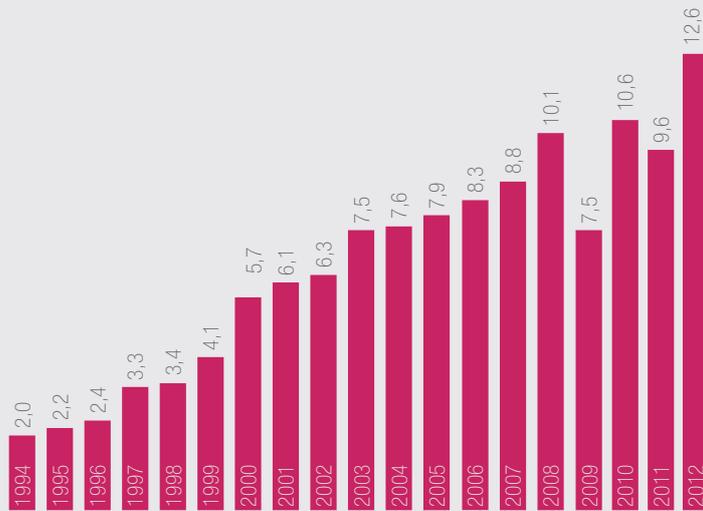
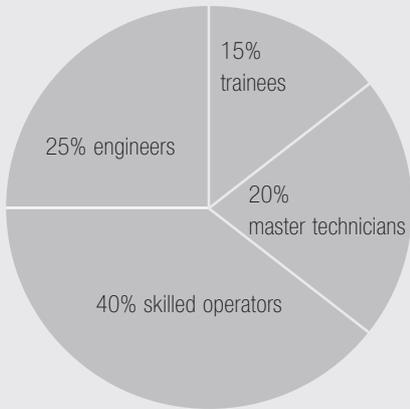
The Basis

Good ideas are born of free minds

Success in special-purpose machine building is heavily dependent on having just the right team in place. Mechanics at the final assembly stage, mechatronic experts putting into operation, programmers, designers and process specialists – constructive cooperation and enthusiasm are essential to a successful outcome. As a logical consequence, we are concerned to encourage our staff to act independently and adopt an entrepreneurial approach.

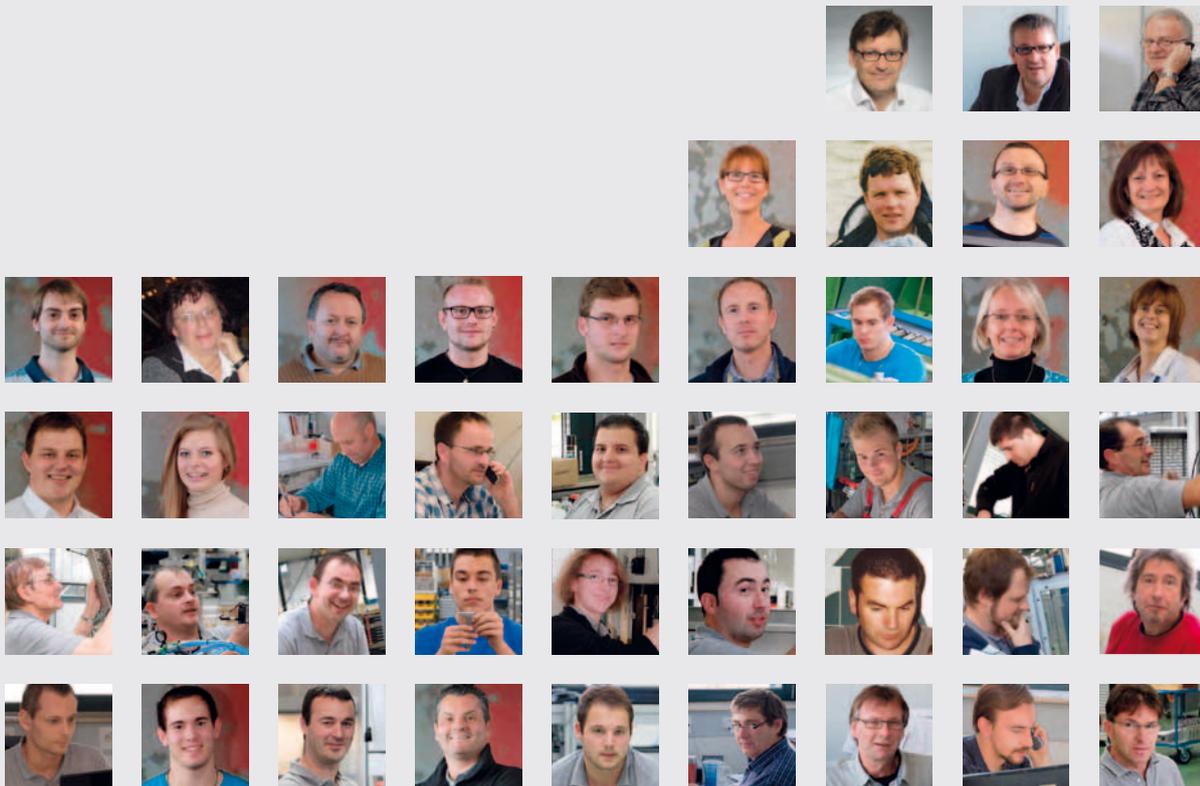
We know that creative minds are the minds of individualists. Encouraging creativity is fundamental to our style of personnel management and is actively promoted through joint leisure activities and individual working time arrangements. The working atmosphere created as a result provides fertile ground for outstanding achievements.





Personnel in the technical departments

Turnover development (in million €)



The Factory

Special-purpose machine building with optimized processes

Through continuous improvements in every field, optimized corporate processes are possible even in the special-purpose machine building sector. From the quotation phase through the precise assembly planning, we rely on our own "Wolf Operations Management System". The software used encompasses important project processing tools and permits ongoing project checks to be made. Designed for flexibility and constructed on a green field site, the factory building offers sufficient space reserves for the future and is designed to minimize walking distances. Our own in-house machining department equipped with a state-of-the-art machine outfit ensures top quality and the availability of components. Machines are built in a flow construction using a flow production process.

The machines pass through four locally separate departments:

- Cell structure assembly
- Final assembly
- Control system, assembly and installation
- Programming, machine set-up and test runs.

This concept permits an outstanding degree of transparency and optimized workstations.



Control construction

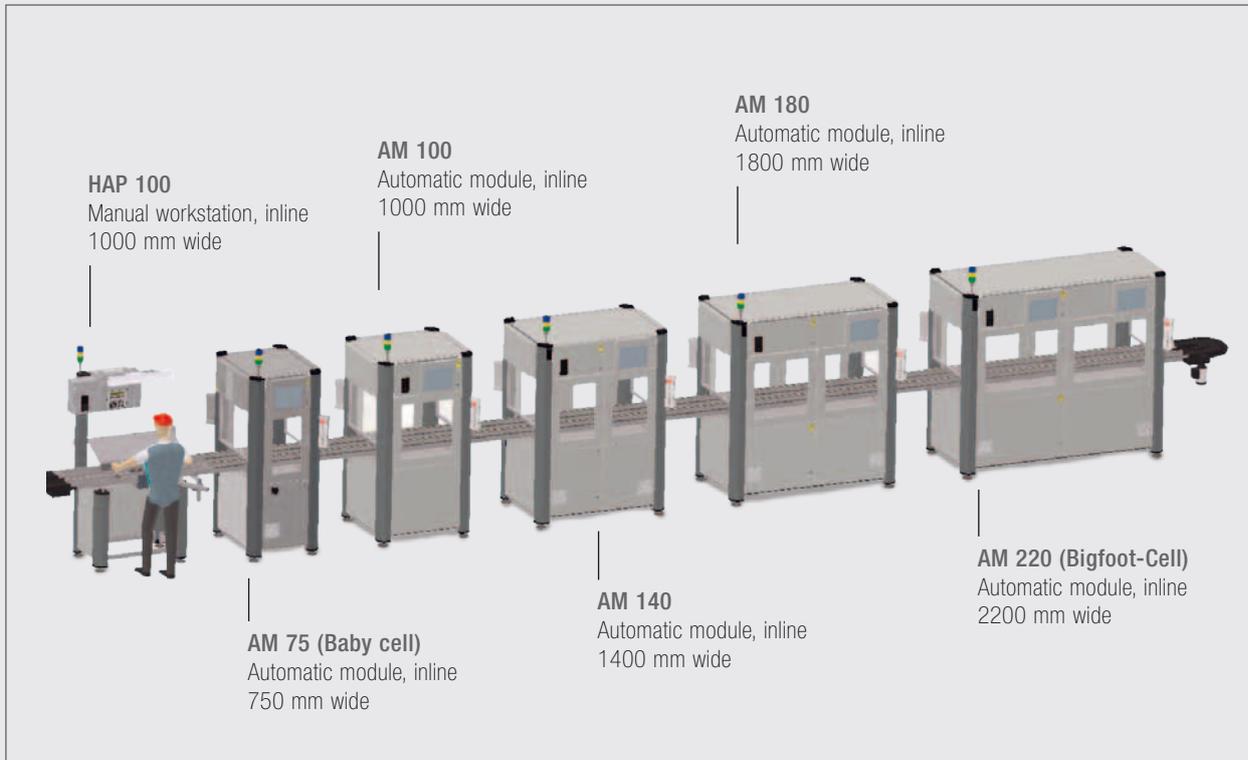


Machining



Programming, commissioning and test runs

The "SkyLine" automation platform



Reach the goal quicker with standardized production modules

The requirements imposed on automatic assembly lines can be summarized by:

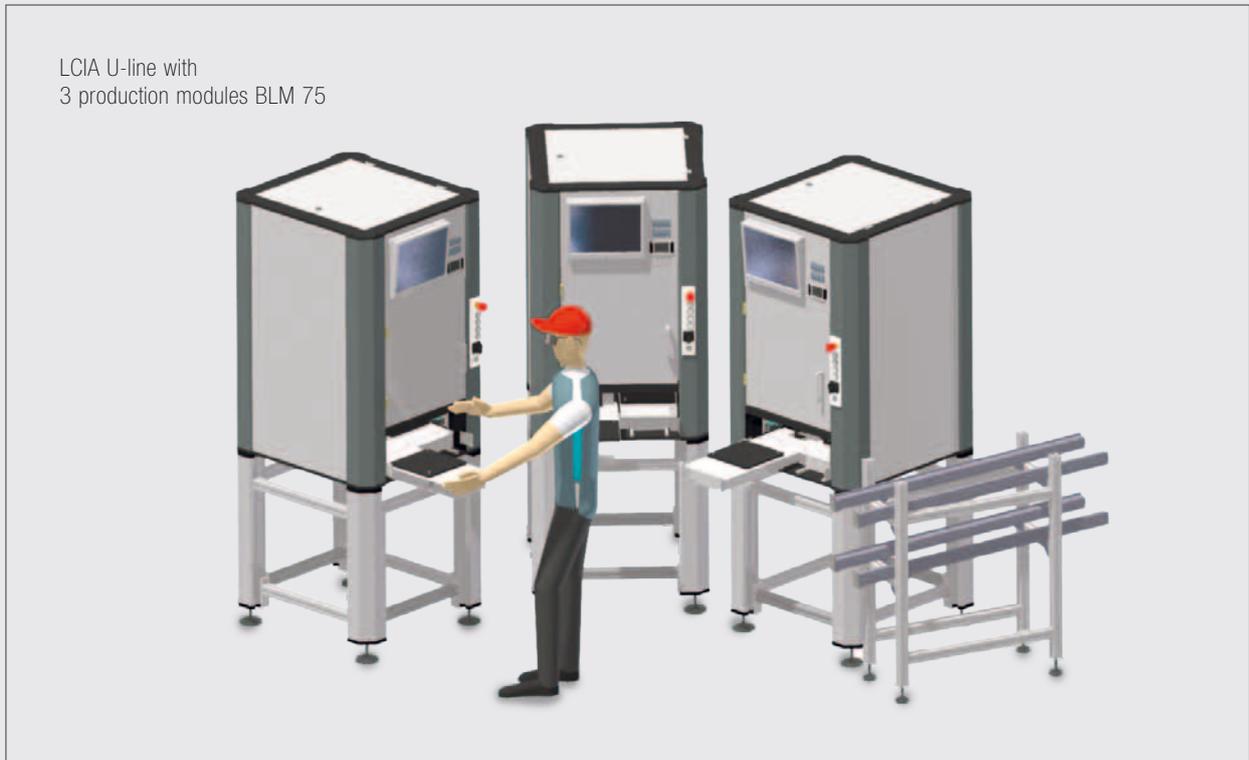
- Process reliability
- Cost per produced part
- Flexibility and
- Short delivery time.

Traditional special-purpose machine builders can only partially meet all these needs. This is why we made the decision to develop our own automation platform, which is being refined and systematically expanded on a continuous basis. The automation platform "SkyLine" provides the optimum basis, from the Stand alone system through to the complete transfer line. Production modules encompass several modular stations which can be designed with quick exchange capability if required. The hardware and software structure of the control systems used is also consequently standardized. "SkyLine" stands for an outstanding degree of:

- Tool change flexibility
- Redesign flexibility



The machine series "BoxLine"



With BoxLine we make "Low Cost Intelligent Automation" (LCIA) possible

With our cost-efficient machines, automatic processes and manual handling activities can be combined.

The compact, slimline machines are equally suitable for single workstations and LCIA assembly lines, known as U-lines.

BoxLine machines are designed for worldwide use, especially in low-wage countries. The supplied transport-box, suitable for air, land and seafreight, enables fast packing and shipping of the machine. Service, e. g. retooling or maintenance can, therefore, be done at the Wolf works. The machine travels, instead of expensive service staff.

Wolf Produktionsysteme guarantees an efficient service. After 24 hours the machine is in the transport-box on its way back.



Special Soldering Processes

The right soldering method is what counts

Choosing the optimum soldering method is essential. This is why we have accumulated an extensive know-how in the different methods for special soldering. Not just theoretically, but in practice too. Soldering tests can be run in the Wolf Technology Centre using the newest demonstration and testing machines.

Laser soldering

- Controlled thermal output
- Non-contact
- Suitable for ultra-fine soldering
- Low maintenance

Iron soldering

- Compensation of position tolerances
- Reliable temperature control
- Cost-effective
- High degree of flexibility

Hybrid soldering

- Combines the benefits of laser and iron soldering

Induction soldering

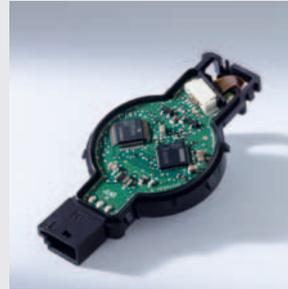
- Even heating
- Deep heating
- Non-contact

Selective soldering with miniwave

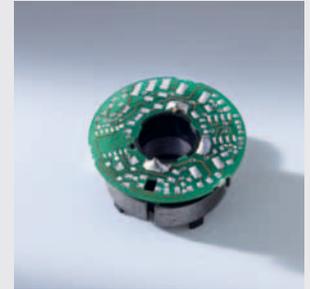
- Reliable temperature control
- High soldering quality
- Position tolerances of product uncritical
- High degree of flexibility

Selective dip soldering

- Reliable temperature control
- Cost-effective
- High productivity (several soldering points simultaneously)
- Position tolerances of product uncritical



Laser soldering



Iron soldering



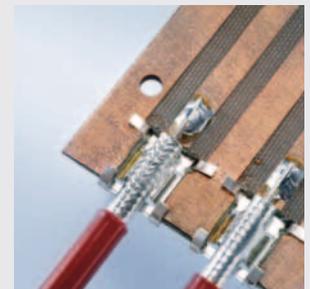
Laser soldering



Laser soldering



Induction soldering



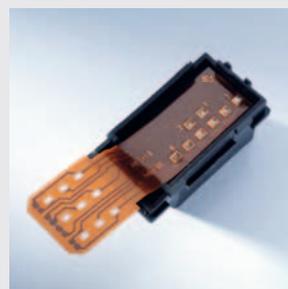
Induction soldering



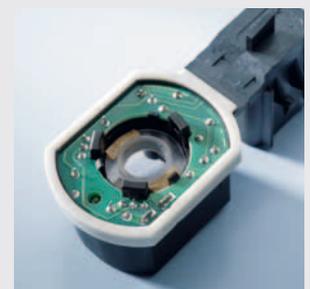
Iron soldering



Selective soldering with miniwave



Selective dip soldering



Selective dip soldering



Laser Processing

Laser welding of plastics enables new product design

Involving small melt zones and minimal input of energy, tight connections are produced with a high degree of weld strength. With these benefits, laser welding can replace conventional joining techniques such as screwing, clipping, gluing or conventional welding methods. Plastic welding generally involves the overlapping of parts creating a joint by laser beam transmission. Scarf joint welding is also possible.

The benefits

- Dense, high-strength welded seams
- Non-contact, local and controlled application of energy
- Perfect looking welded seams for decorative surfaces
- Flexible method – programmable welding contours
- Integration into production lines possible

Precision laser welding of metals

Particularly for miniaturized and high-strength bonds, which are exposed to high ambient temperatures, spot welding offers an alternative to soldering. Modern fiber lasers with high beam quality and pulse energy are well suited for contour welding on miniaturized components.

High-grade markings using laser

The need for traceability, personalization and individualization requires more and more high-quality markings. This is where laser technology has a range of benefits to offer. Depending on the marking task, we offer the following laser types:

- CO₂ lasers
- Nd YAG disk lasers or
- Fiber lasers.

Whether laser marking or laser welding, demonstrations and tests for all laser processes can be carried out in the Wolf Technology Center.



Laser marking and quasi simultaneous welding



Quasi simultaneous welding



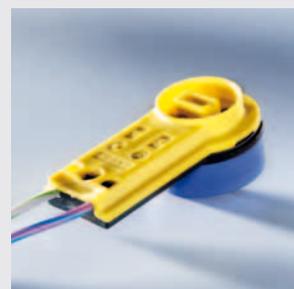
Contour welding



Contour welding



Laser marking with colour variation



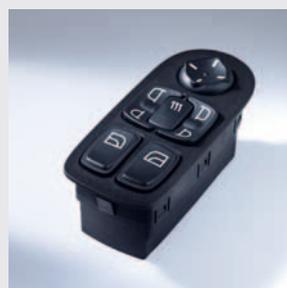
Quasi simultaneous welding



Quasi simultaneous welding



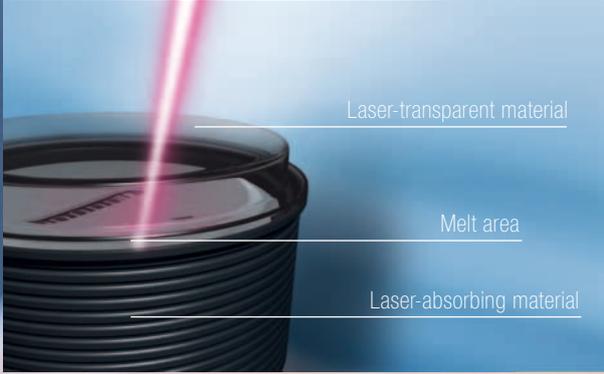
Simultaneous scarf joint welding



Laser marking day-night design



Laser marking of anodized aluminium with colour variation



Laser-transparent material

Melt area

Laser-absorbing material

Assembly Automation

From the idea to the turnkey transfer system

Our process expertise in the field of special-purpose machine building is based on specialization and on an extensive portfolio of completed systems. We only offer assembly plants involving a minimum of 80% already existing process expertise. Wolf Produktionssysteme has specialized in assembly lines with:

- Cycle times between 5 and 15 seconds.
- Workpiece carriers from 80 x 80 to 240 x 240 mm and
- Transfer systems with free workpiece carrier flow.

These are based on the Wolf automation platform with standardized production modules. Systems for the relevant processes, in particular feeding technology are sourced from a pool of competent contract partners.

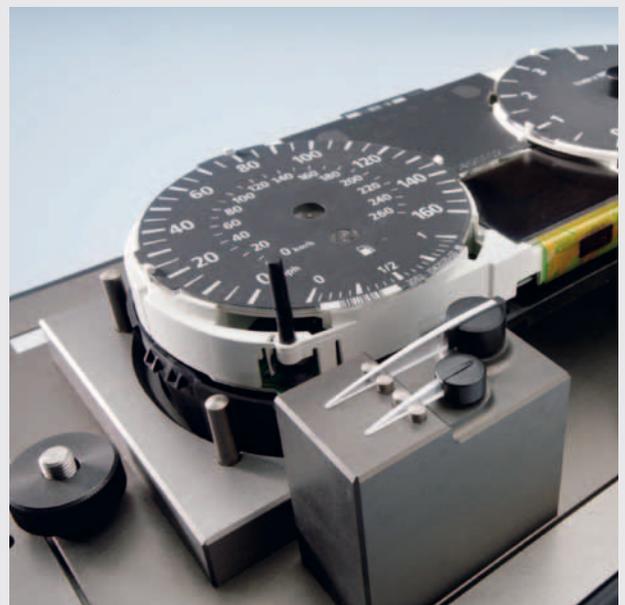
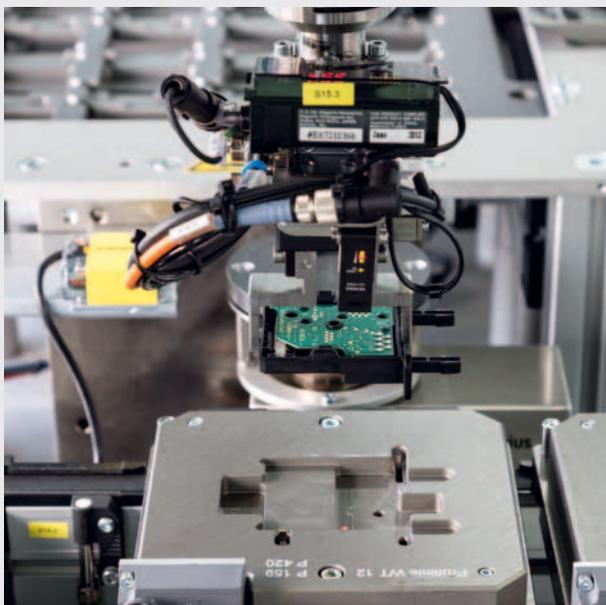


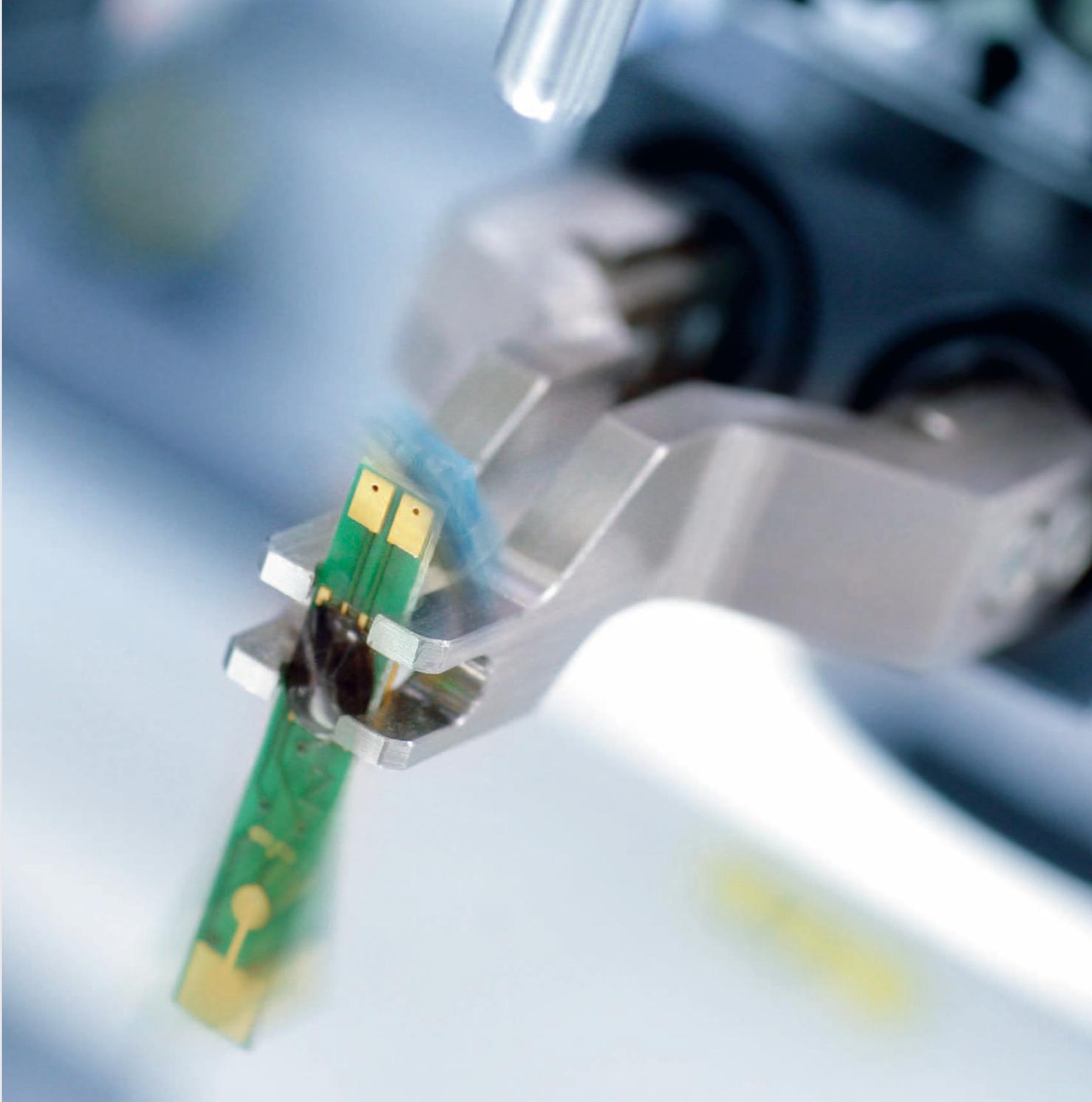
Efficient operation using the Wolf Line Management System

The Wolf Line Management System (WAMS) is designed to render operating data transparency. From the management of process data and orders through product traceability and error evaluation, WAMS has everything needed for the successful operation of assembly lines.

The system is easy to use, and mostly integrated in the machine controls. Through a data interface, the user can extract the data and make own evaluations.

For further extensive demands and the connection to an ERP system, interface ports are available or can be custom created, respectively.





Joining

- Press fitting
- Wobble riveting
- Roll forming
- Clinching
- Soldering
- Hot sealing
- Screwing
- Snapping
- Gluing
- Welding
- Heat stacking

Marking

- Cold / hot foil stamping
- Ink jet
- Labelling
- Colour marking
- Laser marking
- Needle printing

Dispensing

- Hot melt
- UV adhesive
- Encapsulating compound
- Soldering paste
- Flux
- Lubricants
- Conservation oil
- Paint
- Hot melt encapsulation

Feeding

- Vibration feeder
- „Flexfeeder“ with image processing
- Pallet feed systems
- Shaft magazine
- Taped components
- Cutout of punching strips
- Spring feeding systems
- Circuit board magazines
- Blisters

Measurement/testing and...

- High voltage
- Insulation
- Polarity, resistance
- Winding short circuits
- Diameter
- Depth measurement
- Friction (bearings)
- Force-Distance
- Vibration testing
- Colour testing
- Autom. optical inspection (image processing)
- Lens adjustment and testing
- Noise test
- Imbalance measurement
- Laser Vibrometer
- Panel separation
- Heating processes
- CO2 snow cleaning
- Plasma activation

Process verification

We provide support to customers in advance of their product development. Where process-oriented production steps are involved, process verification prior to planning, concept finding and ordering a machine or production line order is vital. An evaluation is needed not only of feasibility but also to find the:

- Optimum method and
- Process parameters.

Whether soldering, laser plastic welding, laser marking and image processing, all suitable systems are available in our Technology Centre.

Machine demonstration

How will the handling of the machine be? How easy is it to operate? It is possible to check and become familiar with the look and feel of Wolf machines using the demonstration models.

Pre-series production

There is an ever greater demand for our pilot series production service using identical process parameters of those intended for subsequent series production.

Endurance testing

Newly developed Wolf machines and components are tested in a climate cabinet at temperatures of up to 50°C.

Training courses and seminars

A technology seminar every year: Already the tenth Technology Seminar will take place in 2014. Another main activity in this field are individual training courses for customers.

Project work

Customers can follow the progress of their order step by step on the Internet. And when it comes to deadlines, absolute transparency is our philosophy: The customer access area of our Internet portal, www.wolf-produktionssysteme.de, allows you to find out about the status of your project at any time. Access is password protected.

Scheduling

An integrated software tool has been developed at Wolf to help ensure promised deadlines. The latest schedules and project checklists can be viewed and downloaded in PDF format. Assignment and deadline checks are IT-supported.

Protocols

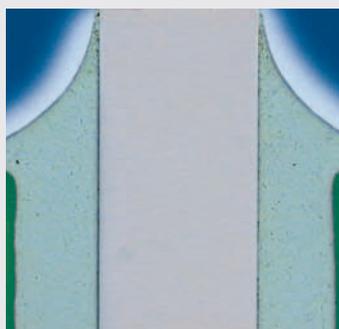
Project protocols are also generated using our own software tool, ensuring that individual protocols can be summarized to create an overall record of your project.

CAD Data

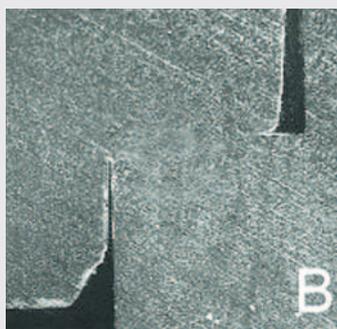
Current machine layouts and design drawings are available for downloading.

Lifetime maintenance

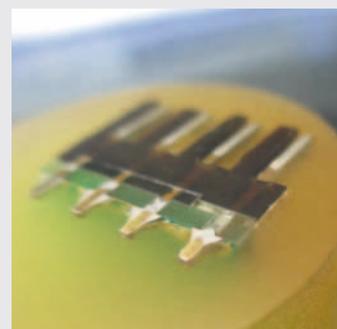
Wolf quality standard includes a service contract offered for each machine, thereby securing the operational availability of the production facilities supplied by us.



Microsection of a solder joint magnified 250 times



Microsection of a laser welded seam



Microsection of 4 soldering joints



There when you need us: 24 hour hotline and servicing

We are committed to providing a competent back-up service worldwide. Wolf machines and production lines undergo exhaustive testing and are designed for low maintenance. The Wolf maintenance contract provides an extended after-sales service with:

- 24 hr hotline
- Teleservice via Internet
- 24 hr service facility for spare parts.



Realized Machines

➤ Automatic laser soldering line for electronic modules with 6 laser soldering robots.
Cycle time: 5 seconds

➤➤ Semi-automatic assembly line for sensor units with in-line casting.
Cycle time: 12 seconds.



➤ Flexible assembly line for fans
Workpiece carrier size: 160 x 160 mm
Cycle time: 10 seconds.

➤➤ Assembly and test line for bearings.
Cycle time: 5 seconds.



Semi-automatic assembly line for drive assemblies
Workpiece carrier size: 160 x 160 mm
Cycle time: 8 seconds



Assembly line for E motor modules
Workpiece carrier size: 240 x 240 mm
Cycle time: 9 seconds



Flexible assembly system for valves
Workpiece carrier size: 240 x 240 mm
Cycle time: 8 seconds



Flexible assembly line for miniature gearboxes
Workpiece carrier size: 120 x 120 mm
Cycle time: 10 seconds



Selective soldering with manually rotated indexing table



Inline Soldering System with two soldering robots for assembly line



Iron soldering system with automatic indexing table (safeguarded by light curtain)



Your route to see us ...

... will take you through one of Germany's most attractive landscapes: The mountains of the Black Forest. Along 24 km of country roads from the Horb autobahn exit (A 81) or 65 km from the Rastatt autobahn exit (A5). You may decide to arrive the evening before or even stay during the weekend. It is worth it. We will be pleased to assist in booking your accommodation.

If you require directions, see our website street map and suggestions for your overnight stay:

www.wolf-produktionssysteme.de

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