PROLINE APPLICATIONS

Complete inspection systems based on the PROline USB ultrasonic inspection device mechanized, automated | immersion or bubbler technique

We design and develop customized PROline ultrasonic inspection systems according to our customers requests.
Complete inspection systems based on the PROlineUSB ultrasonic inspection device
mechanized, automated I immersion or bubbler technique

The ultrasonic inspection system is designed for the mechanized and automated ultrasonic inspection and can be operated within production lines as well as a stand-alone solution for applications in laboratory. Due to its universality, flexibility and open interfaces, PROlineUSB offers ideal conditions for the testing for cracks and volume defects, solder and coating joints, adhesion quality, wall thickness, on e.g. spot welds, shafts, rods, pipes, sheets, synthetic materials and more.

On request VOGT designs and develops (semi) mechanized or fully automated ultrasonic inspection systems for cost-efficient material inspection. Our standard and customized PROline inspection systems guarantee a safe in process and fast inspection with a very high inspection quality for a 24/7 operation. PROlineUSB is also suitable for upgrading old NDT systems with new ultrasonic technique.

Your advantages using PROline
- proven and process-safe mechanized or (semi) automated inspection systems for 24/7 operation
- excellent inspection quality by the use of the latest ultrasonic testing technology
- modular and application specific system design
- flexible adapting to new part types and geometries
- intuitive inspection software design ensuring reliable evaluation with minimal training effort
- short testing times due to a high inspection speed, pulse repetition frequency and time-optimized inspection concepts
- the automated evaluation and result documentation saves time and creates inspection reliability
- customer-specific NDT solutions (inline or offline) within production

Your material
- steel
- aluminium
- cast
- CFRP, e.g. plastic
- copper
- ...

Detection of
- volume defects e.g. pores, pore clusters, inclusions
- flat delamination, boned joints
- spot weld defects, e.g. cracks, slags, lack of fusion
- soldering defects
- ...

Inspection technique
- immersion technique
- local immersion technique
- bubbler technique
- puddle technique
- contact technique
- Phased Array technique

Result
- OK / not OK signal
- A-, B-, C- or D-Scan display presentation in terms of line- / area scans
- raster evaluation
- A-Scan Analysis

Modular PROline inspection systems
- application-specific inspection techniques
- robust system design for the use in production
- expandable due to modular design
- automated, semi automated inspection operation
- latest control technology ensures an exact mechanical positioning for the detection of smallest defects
- manual and/or mechanized component insertion and extraction in various solutions by hand according to appropriate safety precautions or by robots
- easy and reliable system check and calibration, also available in automatic mode
- easy setup for new components
- probe mechanics for compensation of the squint angle and exact positioning of the sound field to the component (mechanized A-B-manipulator)
- motorised A-B-manipulator
- probe coupling locally for typical standard UHF probes and miniature probes
- ensuring of the traceability of the inspection result of a component, e.g. via Data Matrix Code or RFID-Tags (transponder technology)
- interaction with the ERP/SPS interfaces of the customer
- remote connection for updates and service for fast reactions
- ultrasonic technology optimized water conditioning system with centrifugal pump, UV sterilization, circulation, microfilter etc.
- integrable cleaning and drying module
Automated inspection in immersion technique

This flexible inspection system works either in a production line or as a stand-alone solution. Due to its modular design the system can easily be adapted to different inspection requirements and components. With this system version different types of differential gear wheels with similar physical inspection requirements can be tested automatically. The conversion is carried out quickly and easily by component-specific adapters, regardless of lot sizes. In a next stage of expansion, the system can optionally be equipped with an automatic component supply by a robot.

By means of a spiral scan, the probe scans the weld seam horizontally while the component is rotating.

The analysis software is used for defect valuation and documentation. The testing system also offers marking of the defective components fully automatically.

Immersion-free inspection via bubbler technique

This inspection system is a second version of the system above, but for water-sensitive components. PROline inspection systems can work completely immersion-free by using bubbler technique. This method minimizes the necessary time for the inspection process by cancelling the drying of the components.

The recording of the component identification is performed via DataMatrixCode (DMC), securing the traceability of the inspection result of each component. The operator-friendly PROline inspection- and evaluation software provides a clear inspection report according to individual requirements. The communication of the inspection results with the higher-levelled customer system is performed via ProfiNET interface.

Minimization of scrap in the laboratory

This compact inspection system has up to six axes and is ideally suited for the use in laboratory and in production. An application example is the use of the system for the research of ideal welding parameters for the production. Therefore an user-friendly inspection software is required, adapting to the requirements of the operators.

The intuitive operated PROline inspection- and evaluation software is of modular design and concentrates on intuitive handling with simultaneously highest flexibility. With little training effort the customer is able to create inspection plans in shortest time to optimize the welding process. By filing various inspection plans different types of components can be flexibly inspected one after another without effort.

The automatic evaluation, creation of inspection reports and report archiving saves time and creates inspection reliability.

Inspection using Phased Array technology

Inspection system with Phased Array technology are part of our portfolio as well. This PAUT system is suited for the inspection of complex WCu components. This kind of technology enables the inspection of components with a high inspection sensitivity and at the same time a large track gauge.

In this application contact tulips are inspected with only one necessary part rotation. By using individual focal laws a flexible adaption to various component types is possible.

Following to the scanning process the software automatically generates an online C-scan evaluation. Possible indications are evaluated according to predefined criteria.

The subsequent sorting is manually performed by the operator or automatically by existing mechanics provided by the customer.

Inspection result with e.g. information on determined defect areas, percentage value of the welded areas, number of invalid displays, levels of amplitude or depth and much more.

Applications

Implemented customer-specific PROline inspection system solution
**Applications**

**Implemented customer-specific PROline inspection system solutions**

**Inspection of tubes and bars**

This PROline inspection system was developed for the inspection of tubes and bars in immersion technique, in this specific application for piston pins.

By integrating the system into the production line, critical quality deviations are now detected quickly and in time in order to avoid claims and consequential costs.

The volume testing with immersion technique is documented completely and ensures traceability up to the individual component.

![Image](image1.png)

**Fig:** View from the top into the immersion tank of the PROline inspection system for bars and tubes

The ultrasonic inspection is carried out as a spiral scan with 3 probes capturing the entire volume of the piston pin during one pass only.

The automated analysis of the test and the complete documentation saves time and creates inspection reliability. The PLC control transfers the test result to an external laser marking unit, which then embosses on the workpiece the inspection result inclusive component details.

**Clusterprobes for minimal inspection times**

PROline systems can be manufactured in all sizes. This pipe inspection system is able to inspect ferritic, austenitic, seamless and welded pipes on several quality defects in one pass.

For this application two probe clusters, each with five conventional ultrasonic probes, are being used. Each cluster is controlled by a PROline™ ultrasonic inspection device. Due to the star-shaped arrangement of the probes of each cluster doublings, longitudinal- and transverse defects as well as the wall thickness of the pipes can be simultaneously inspected in accordance with common standards DIN EN ISO 10893-8, 10893-10 and 10893-12.

The arrangement of two identical designed clusters in one row behind each other allows high inspection speed in two tracks and consequently a significant reduction of the total inspection time.

With the PROline™ inspection software we have developed a suitable software in a flexible overall package. Different types of pipes can be stored in the system as defined inspection plans. The communication of the ultrasonic inspection system with the plant control system is performed via Profinet-interface and allows additional inspection measures, e.g. a second inspection of a sensitive area for the validation of potential material defects.

**100% automated inline inspection with robots supports zero-fault process**

With this PROline inline inspection system cardan shafts are being inspected fully automated and non-destructively via ultrasound.

The integration of the inspection system in the production line replaces the prior manual inspection of the customer.

In the inspection-time optimized application, the inspection and evaluation software PROline™ supplies the inspection data and the results directly to the ERP-system of the customer for the component specific recording and documentation of the inspection results.

![Image](image2.png)

**Fig. left to right:**
- Component positioning by a robot provided by the customer,
- Inspection in immersion technique, automated color marking (O.K.)
- Automated ultrasonic inspection in a small space

This PROline system is designed for the fast immersion inspection of various types of components without setup time. The space-saving ultrasonic inspection system, being loaded by a robot, was directly implemented into the production process.

There are three different probes on adjustable holders in an immersion tank. Every probe operates another component type which is allocated in the PROline™ inspection software. This eliminates any upcoming setup times. After the inspection, the component is automatically transferred into the integrated drying unit.

The operator is able to generate inspection plans after a minor effort of training due to an intuitive software handling. The storage of different inspection plans allows the flexible and successive testing of several component types without much effort.

The software automatically creates a clear inspection protocol according to the requirements of the operator. The inspection result communication is effected to a superior customer system via Profinet interface.

![Image](image3.png)

**Fig:** PROline ultrasonic inspection system for the inline spot weld inspection of disc carriers

- The loading of the components is performed by a robot provided by the customer.
- The space-saving ultrasonic inspection system, being loaded by a robot, was directly implemented into the production process.
- The software automatically creates a clear inspection protocol according to the requirements of the operator. The inspection result communication is effected to a superior customer system via Profinet interface.

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**Technology partner:**

Laubinger + Rokmann GmbH & Co. KG
At your service since 1983
Our experience for your certainty

Innovative ultrasonic technology is the key to reliable and fast material inspection in production and laboratory.

With future-oriented ultrasonic technologies and processes, as well as a comprehensive range of inspection services, we are your partner for nondestructive material testing.

We develop and produce high-performance ultrasonic inspection devices and systems for inline and offline inspection as well as OEM solutions and modernize old inspection systems with the latest ultrasonic technology. Furthermore we are sales partner of well-known manufacturers and technology partner of renowned companies. On this basis, we realize your ideal inspection solution according to your requirements and wishes.

At your site or in our test centre in Burgwedel (Hanover), we provide all conventional nondestructive inspection services as well as mechanized and automated ultrasonic inspection solutions.

Being a medium-sized company with short decision paths, we are able to adapt the requirements of our customers competent and reliable. We not only have the very best technical resources and qualifications, we take on your request with passion, great care and a high sense of responsibility.

Applications
Automated and mechanized inspection of:

- Metal- and composite materials
- Forged and casted parts
- Optical fiber and carbon fiber reinforced components
- Weld seams and bonded joints
- Aircraft wings and tail sections
- Rocket boosters
- Aircraft turbines
- Steel- and plastic pipes
- Pressure vessels and pipelines
- Railroad wheel sets and rails
- Spot welds in the automotive industry
- and many more

VOGT is accredited acc. to DIN EN ISO/IEC 17025 as well as ISO 9001 and certified acc. to EN 9100.