

Krautkrämer SpotVision

Image-based spot weld inspection with a flexible probe head for deeper insights into the welding process.

- Increase process control
- Avoid false negatives
- Reduce training time

Inspection starts here.

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Technologies**
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Confidence can be that easy.

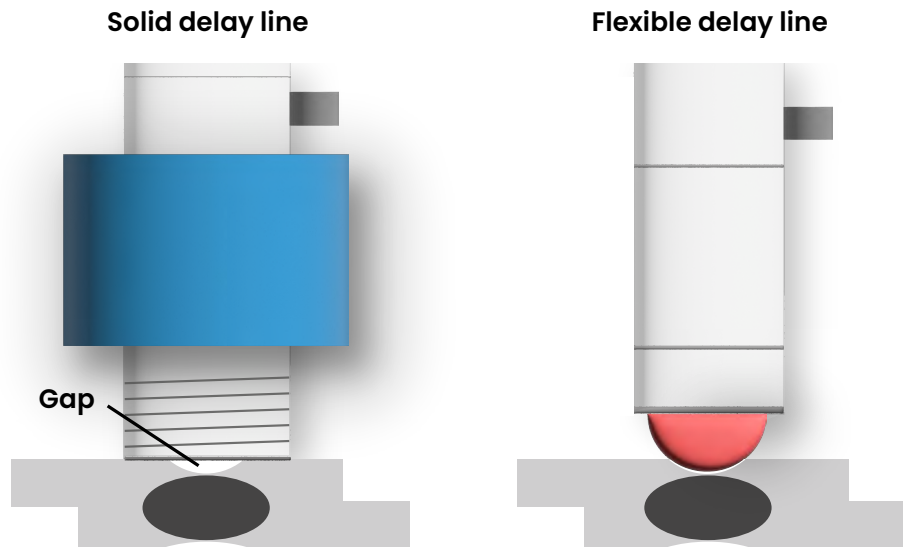
Faced with ever increasing pressure to reduce downtimes while meeting high quality standards, the automotive industry is turning towards image-based spot weld inspection. Vehicle production is growing, and so is the number of spot welds that need to be inspected. Inspectors therefore need to look deeper into the welding process, beyond a simple good/not good evaluation of spot welds, to elevate production efficiency.

Developed in collaboration with automotive manufacturers, Waygate Technologies introduces Krautkrämer SpotVision, the fastest, easiest, and most accurate phased array solution for spot weld inspection. Confidence that your parts are adequately welded will not only increase productivity, but also ensure that quality standards are met every time, thereby guaranteeing product safety.

Get more accuracy

The Krautkrämer SpotVision solution combines a new phased array probe with latest software and the Krautkrämer Mentor UT phased array flaw detector for imaging accuracy at the highest level and comprehensive insights into spot welded joints.

One of its most notable features is the newly developed 2D matrix phased array probe. A first in the industry, its membrane is filled with fluid, allowing it to adapt to uneven surfaces and the overall complex geometry of spot welds better than any other probe. The flexible probe head ensures optimal acoustic coupling with the test piece so that the image of the spot weld covers its full diameter and false negative results are avoided.

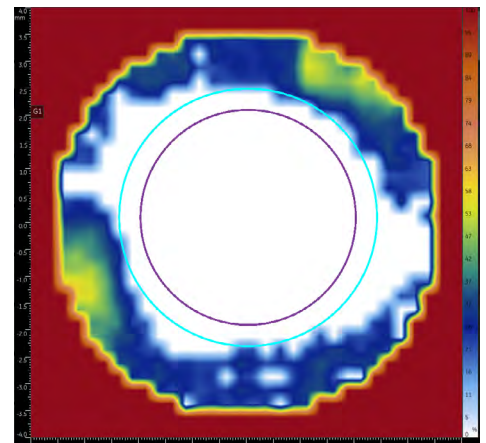


Because of its flexible probe head the SpotVision probe is not sensitive to the weld indentation. Hence only minimal couplant is required.

The 2D matrix probe is combined with another novelty in spot weld inspection: Total Focusing Method (TFM) imaging. With the TFM image processing, a higher resolution and measurement accuracy with a comparable phased array is achieved. Krautkrämer SpotVision is a practical and easy-to-handle probe, nevertheless, it operates with a frequency of 13MHz and comes with an effective array of 32 elements, and a spacing of 1.25mm. Because of TFM, each element is fired individually and sequentially, while all elements are listening. This results in 32×32 elements = 1024 A-scans, combined in a comprehensive picture of the spot weld. All information is interpreted and presented to the operator in an easy-to-understand way. Additionally, the SpotVision probe includes a virtual conventional probe that can be used for AEC (A-scan Evaluation Criteria) to determine the remaining wall thickness.



Krautkrämer SpotVision is a practical and easy-to-handle probe



Actual nugget size and acceptance criteria

Being spot on can be that easy.

Simplify inspections & save costs

By switching to image-based inspection of spot welds, Krautkrämer SpotVision simplifies the inspection process. It is easy-to-set-up and -use and therefore offers not only a time advantage for seasoned inspectors, but also reduces training requirements for qualified inspection personnel. This is due to the intuitive user interface of the software. It utilizes a database that allows the generation of detailed workflows and inspection plans in advance which can then be applied step-by-step by the operator.

With the Mentor PC Live software, the instrument is connected to a PC through ethernet which is especially helpful when the operator is at a different location. Mentor PC Live performs the instrument's functions from the PC, with the bonus that set-up and data files are saved directly on the PC.

Krautkrämer SpotVision also minimizes costs by increasing productivity and reducing scrap thanks to the improved evaluation process and minimized false negatives.



The user interface is intuitive and easy-to-use

Producing quality parts with high throughput

The accurate and repeatable reconstruction of the nugget diameter or the welded area gives an improved insight into the welding process on site and enables better process control. Overall, the image-based evaluation provided by Krautkrämer SpotVision contributes to the quality of the final product. Avoiding false negative results with its flexible probe head design means minimizing process delays such as changeover and calibration times, while ensuring compliance with conformity, safety, and warranty regulations.

Krautkrämer SpotVision was developed together with automotive manufacturers to ensure minimum cycle times for the inspection of resistance weld spots, a critical parameter for their high volume production lines.

Krautkrämer portable inspection solutions for the automotive industry

Krautkrämer SpotVision is part of the Waygate Technologies portfolio of sophisticated solutions for the inspection of joints. Next to the SpotVision solution for the inspection of spot welds, this includes the Krautkrämer Bond Scanner for inspecting adhesively bonded joints with fast and easy to interpret 100% coverage.

Both solutions are designed for ideal use in combination with the Krautkrämer Mentor UT phased array flaw detector. The user-defined workflows walk the inspector through every step of instrument setup – from probe selection and calibration to reporting.



Krautkrämer Bond Scanner allows for the fastest and easiest testing of adhesively bonded parts



For spot weld inspection, Krautkrämer SpotVision is the simplest and most accurate phased array solution

The portfolio offers a customized solution for the automotive market that yields the fastest, most accurate and easy-to-interpret results. It also provides a solution focusing on one device with multiple application options instead of isolated devices, which simplifies using the inspection equipment and thereby reduces the training time required for inspection personnel. Of course, the Krautkrämer SpotVision and other components of the portfolio are also available separately.

Technical Specifications

Probe specifications	
PA probe	32 elements (6x6 array without corner elements), nominal frequency 13 MHz, flexible delay line to adapt to spot weld surface (weld indentation)
Probe dimensions	ø17 x 34 mm (excluding flexible delay line)
Probe cable length	3 m
Inspection area	7.5 x 7.5 mm
Intelligent probes ensure the correct probe is used for inspection and part and serial number are documented	
Inspection	Manual
Typical screen refresh rate	10 Hz
Sheet combinations	2T / 3T
Plate thickness range	0.6 – 3.5 mm
Spot weld diameter range	2.0 – 6.0 mm
Material types	Mild steel, high strength steel (HSS), dual phase ultra-high strength steel <i>Contact our Solution Experts for different materials, such as aluminum.</i>
Coatings	Bare, zinc coating (galvanized, galvanized), e-coating, paint
DB Manager	Defining inspection plan, analyzing, analytics and archiving. Import of legacy inspection plans
Image based spot weld diameter reconstruction	
Algorithm using	TFM and FMC
A-scans per measurement	1024
Reconstruction resolution	0.25 mm
Accuracy	±0.5 mm
Repeatability	±0.5 mm in accordance with VDA5
A-Scan based weld quality identification	
Legacy algorithm based on	A-Scan evaluation
	A-Scan evaluation criteria I
	A-Scan evaluation criteria II
	A-Scan evaluation criteria IV

Parts and Accessories

Krautkrämer SpotVision Base Kit UP680023

Part Number	Part Name	Description
164M6345	Mentor UT SpotVision Base Kit	Mentor UT device, including power adapter, communication module, shipping case, probe connector adapter and quick start guide
UP600673	Probe: G13MAPA-32	SpotVision 2D phased array probe, 32 elements
UA600722	SpotVision Reference Block	Reference block including 9 different, machined nuggets, diameter ranging from $\varnothing 2.5$ to $\varnothing 6.5$ mm

Krautkrämer SpotVision Upgrade Kit UP680024

Part Number	Part Name	Description
164M2272	USB drive with SpotVision UT SW and Docs	USB drive containing the software installers for the SpotVision application and documentation
UP600673	Probe: G13MAPA-32	SpotVision 2D phased array probe, 32 elements
UA600722	SpotVision Reference Block	Reference block including 9 different, machined nuggets, diameter ranging from $\varnothing 2.5$ to $\varnothing 6.5$ mm

Accessories

Part Number	Part Name	Description
169M6195	Tyro remote control, 8 buttons	Remote control with 8 buttons



**Contact your local sales representative
for a demo or to learn more**

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