VIRO WSI

Prevent Recalls with Automated Weld Seam Inspection

VITRONIC

VITRONIC – Technology Leader in Automated Weld Seam Inspection

Defective weld seams, especially in safety-relevant automotive components, can lead to serious problems for manufacturers. In worst-case scenarios, **recalls** can cost a company millions, not to mention potential **damage to the company image.**
In addition, **manual inspection is expensive and prone to errors**.

For these reasons, VITRONIC has been developing its VIRO WSI solution since 1995. The **automated optical inspection from VITRONIC** is far superior to manual inspection. As well as being **objective and independent of external influences**, it consistently follows predefined quality criteria. It detects even the smallest defects in weld seams and visualizes these for reworking.

→ **Reliability**

→ **Safe weld seams**

With VIRO WSI, VITRONIC sets the industry standard for automated weld seam inspection. For decades, **OEMs and tier 1 suppliers** have relied on VITRONIC's technical expertise and customer-focused consulting. They **regularly rate VITRONIC as a technology leader** in internal benchmark tests.

The VIRO WSI –

inspection system

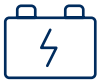
With VIRO WSI from VITRONIC, manufacturers can ensure that only **flawlessly welded components** make it to the next step in the production process. The optical inspection system is a **fully-automated solution** that inspects all weld seams and detects defects as small as 0.1 millimeter. The sensors used in VIRO WSI were also specially developed for inspections on reflective materials like aluminum. VIRO WSI is **100% reliable and extremely efficient**.

As the **inspection takes place in the welding line directly**, it's easy to quickly intervene in the upstream welding process. As a result, defects are consistently reduced, processes are optimized, and downtimes, reworking and waste are all avoided.

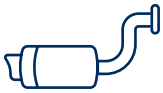
VIRO WSI consists of an inspection cell with sensor, a high-performance computer processing unit and software. The solution is a **key component in automated manufacturing** and, for many years, has been successfully used in the international automotive and automotive supply industries for:

axle components

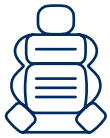
car bodies



batteries and battery boxes



exhaust systems



seats

steel wheels

VIRO WSI From VITRONIC – the Benefits:

- → **Fully integrated inline inspection**
- → **Detects an unrivaled broad inspection range**
- → **Reliably ensures product quality**
- → **Simplifies rework**
- → **Permanent process optimization**
- → **Reduces work hours and costs**

The Inspection Range –

Extensive and Adaptable

VIRO WSI's inspection range is exceptionally broad and is unique in the market.
The inspectioncriteria can be configured to suit **diverse requirements and applications**.

The system is **extremely reliable**, even when it encounters flat seams, highly reflective materials such as aluminum, seams with differing geometries, and fast image recording speeds.
VIRO WSI **pinpoints the exact size and position of each defect and classifies it**.

Exceptionally broad inspection range (excerpt):

- Throat thickness
- Distance in X, Y
- Undercuts
- Hole / burn-through
- Weld connection signal jumps
- Seam connection angle
- Seam width / length
- Seam width / position for overlap seams
- Seam position
- Convexity or incompletely filled groove
- Seam irregularity
- Weld volume
- Butt weld
- Surface irregularity
- Object height
- Porosity
- Spatter
- Gap width for overlap seams
- Unequal leg length
- Deepening

The Solution for All Weld Seams

VIRO WSI inspects all types of seams, irrespective of the weld method used, and identifies defects as small as 0.1 millimeter.

- **Laser weld seams**
- **MIG / MAG weld seams**
- **Brazed seams**

Databases –

Seamless Documentation and Analysis

All **inspection results for every seam and every component** are **stored** in an integrated database for documentation purposes. The data from several inspection stations can be stored on a central server and **statistically evaluated as a whole**.

Pareto analyses in the database view can quickly identify any potential for **production optimization**. The parameters for quality inspection can be adjusted during the production process and are automatically applied to the next system cycle. This **minimizes costly reworking and scrapping of parts**.

In addition, any completed **rework and evaluations of inspection results** can be manually entered in the database. With VIRO WSI, all weld seam inspections are **seamlessly documented** and are **fully traceable** during the entire production process.

Visualization –

Easy Configuration and Reworking

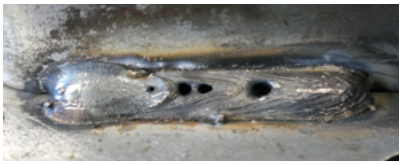
All information relating to the weld seam inspection is visualized in the VIRO WSI software – from **setting parameters** for inspection to the **display of defects for reworking**.

The displays are **extremely precise** yet clear and understandable. After only a brief introduction, employees can independently access results and rework defects using the integrated touch display or external visualization stations. In addition to purely manual reworking, a special classifier also supports automated reworking.

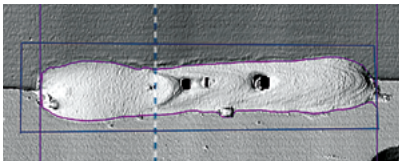
How VIRO WSI Visualizes Weld Seam Defects

Defects can be easily analyzed and reworked thanks to the various visualizations. The software provides detailed instructions for reworking.

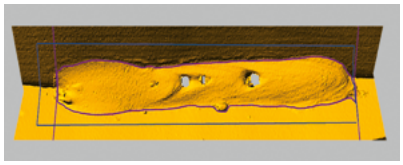
Example: **Filled weld with pores**



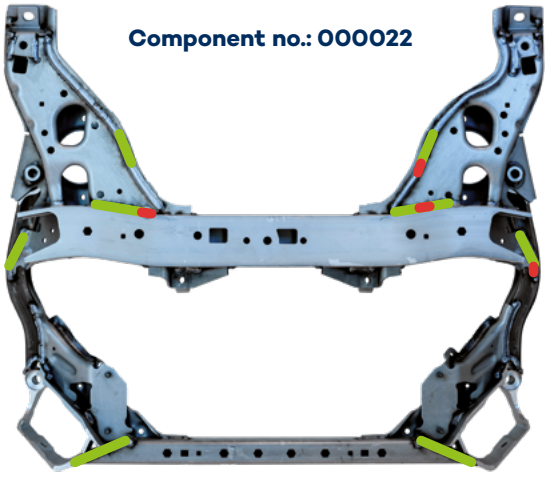
Real image



Precise, detailed inspection image



3D visualization



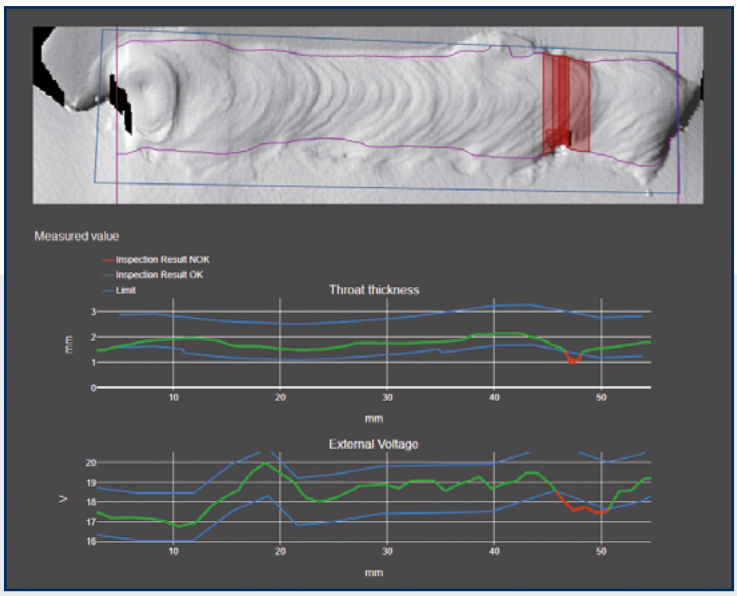
Clear visualization of defects in live operation

Weldloop –

Optimizing Processes with Integrated Data

With the supplementary Weldloop software, **data from the automated weld seam inspection can, for the first time, be linked with process data from the welding process**. Thanks to Weldloop, large data volumes can be efficiently analyzed and trends recorded graphically. This means that welding engineers can **quickly detect deviations and their possible causes**, as well as the welding station where they occurred.

The additional data can be used to **optimize the welding process much faster and in a more targeted way to prevent future defects. As a result, manufacturers can significantly cut costs, reduce downtime, and avoid waste.**



Detecting deviations by analyzing process and inspection data

Benefits of Software-Supported Process Optimization

- **Cost reduction**
- **More stable welding processes**
- **Less downtime**
- **Less time spent on rework**
- **Less waste**

Contact us for more information.

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