Strip Inspection System - Ultrasonic testing of steel plates & sheet

(FLAW HUNTER UST 9508)

- Importance of Lamination Defect Detection in Steel Plates
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Importance of Lamination Defect Detection in Steel Plates

Detecting lamination defects and ensuring quality control in steel plates and sheets is a critical step in steel manufacturing, particularly for industries where material integrity is paramount. In response to this need, *Pejvak Rayan* has developed, manufactured, and commissioned the FLAW HUNTER UST9508, a state-of-the-art ultrasonic testing system specifically designed for lamination and delamination detection in steel sheet and plate production lines.

For oversized or non-automated formats where online inspection is impractical, we also offer a semi-automated trolley-based ultrasonic testing solution, tailored for flexibility and ease of use across large-format steel plates.

Compliance with International Standards

In the manufacturing of line pipes for oil and gas transmission, compliance with international standards such as API 5L, ISO 10893-9, and EN 10160 requires thorough UT inspection of plates to detect internal and surface defects including lamination, delamination, inclusions, and debonding. These structural flaws, if undetected, can compromise the integrity of the final welded pipes used in critical infrastructure.

Technical standards typically mandate that a minimum of 25% of the plate's effective width, along with 25 mm from each edge, be inspected to ensure defect-free performance in critical zones.

Common Defects in Steel Plates

Steel plates and sheets may contain various defects such as cracks, shrinkage cavities, slag entrapment, and non-metallic inclusions. Depending on their size, location, and end-use application, such defects—especially laminations—can significantly reduce material strength, posing serious risks when used in high-demand sectors like oil & gas, petrochemicals, power plants, and automotive industries.

Therefore, inline ultrasonic detection of lamination defects during plate production is a crucial quality assurance step for both manufacturers and end-users.

FLAW HUNTER UST9508 – Advanced Ultrasonic Inspection System for Steel Plate Quality Control

Technology Overview

The UST9508 leverages the latest in non-destructive ultrasonic testing (UT) technology. It is suitable for both online and offline inspection of steel sheets used in the manufacturing of ERW pipes, spiral welded pipes, and various other industrial products. The system works through the following principles:

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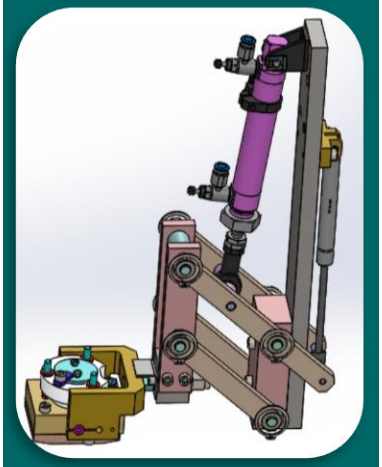
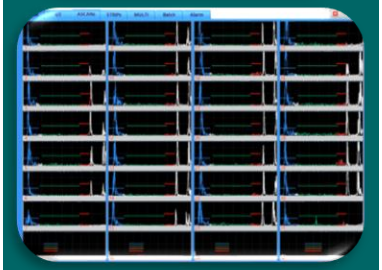
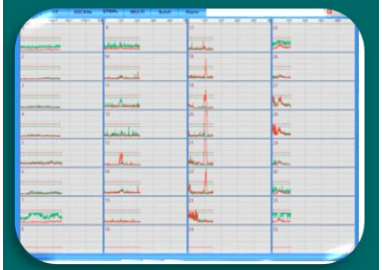
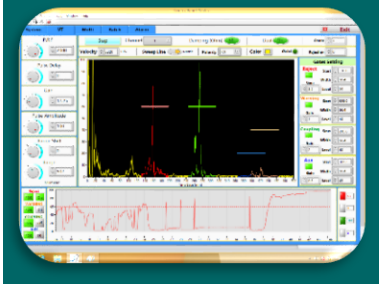
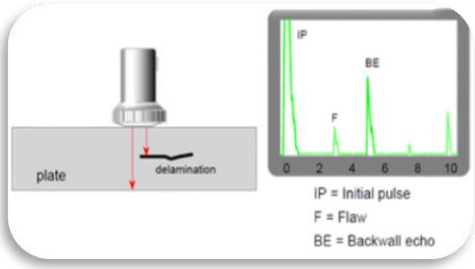








1. **Ultrasonic Pulse Transmission:** Ultrasonic pulses at a center frequency of 4 MHz are transmitted into the steel plate using high-resolution T/R (Transmit/Receive) probes.
2. **Signal Reflection:** In defect-free areas, reflections are only detected from the back wall. The presence of any subsurface flaw causes an early echo, indicating internal discontinuities.
3. **Automatic Signal Analysis:** A powerful signal processing algorithm analyzes the echoes, identifies flaws, and reports their depth, position, and severity both numerically and graphically.



Technical Highlights

Precision & Configurability

- The system is configurable with 4 to 100 channels, depending on plate width and desired coverage (from 25% to 100% of plate width).
- Supports online and offline operation, with fast switching capability.
- Designed for high-speed production lines with real-time feedback.

Advanced Probe Configuration

- High-resolution T/R probes capable of detecting flaws from 2 mm below surface.
- Engineered mounting system ensures each probe pair covers at least 25% of plate width plus 25 mm from edges.
- Innovative Water Gap Coupling eliminates direct contact with the surface, reducing wear and improving coupling efficiency.

Test Range

- Plate thickness: 4 mm to 50 mm
- Detectable lamination depth: 2 mm to 50 mm

Mechanical & Control Features

- Dynamic suspension system keeps probes in consistent contact with the plate surface.
- Edge-tracking mechanism automatically adjusts probe position relative to plate edges.
- Offline calibration possible without halting production.
- All inspection data is recorded in individual strip charts with full archive and positional/depth analytics.

Advanced Positioning & Marking Capabilities

- Integrated digital encoder beneath the plate ensures precise longitudinal flaw localization.
- Equipped with an industrial paint marker for automatic tagging of detected defects on the plate surface.
- Full integration with MES/ERP systems for real-time monitoring and traceability.

Applications

- Pipe manufacturing lines (Oil, Gas, Steam, Water)
- Steel sheet inspection for Petrochemical, Power Plant, Refinery, and Automotive industries
- Final inspection before spiral or longitudinal pipe forming

Competitive Advantages

- Superior performance with competitive pricing in Asia and the Middle East
- Full on-site installation, commissioning, and training
- Expert technical support and spare parts supply
- Compliant with ISO, API, EN, and DIN standards

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Unique Features

-Inline installation capability allows defect detection prior to plate forming or pipe welding.

-Features online calibration and integrated water recovery system, ensuring system reliability and extended equipment lifespan.

Advantages of choosing Pejvak Rayan Company

Industrial Ultrasonic Testing Equipment Manufacturer

-Trusted Expertise:
Over 20 years of experience in ultrasonic testing systems.

-Advanced Technology:
High-accuracy flaw detection with global standards; suitable for pipes, billets, rebars, ingots, sheets, and plates.

-Cost-Effective Quality:
Competitive pricing tailored for Asian markets — without compromising performance.

-Complete Service:
On-site installation, professional training, and ongoing technical support.

Experience world-class technology with region-friendly pricing

Pejvak Rayan – Precision You Can Rely On

Technical Specifications – FLAW HUNTER UST9508		
No	***Feature***	***Specification***
1	***Plate Width Range***	***600 mm – 4000 mm***
٢	***Plate Thickness Range***	***4 mm – 50 mm***
٣	***Material Types***	***Steel (Grades A to X80)***
٤	***Inspection Speed***	***Up to 40 meters per minute***
٥	***Channels***	***4 to 100, customizable***
٦	***Reference Defect***	***Flat Bottom Hole (FBH) Ø 6.3 mm***
٧	***Detectable Flaws***	***Lamination defects (≥ FBH Ø 3 mm)***
٨	***Inspection Coverage***	***25%–100% width + 25 mm from edges***
٩	***Signal Storage***	***Up to 2000 calibration sets with retrieval function***
١٠	***Data Output***	***USB, CD export – full strip chart data logging***
١١	***Alarm System***	***Gate-triggered visual, acoustic, and paint marker alerts***
١٢	***Probes***	***T/R type, 4 MHz, 25–30 mm crystal size***
١٣	***Additional Hardware***	***I/O card (4 inputs, 7 outputs), industrial PC, UPS 2KW, operator panel, air-conditioned cabinet***

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