

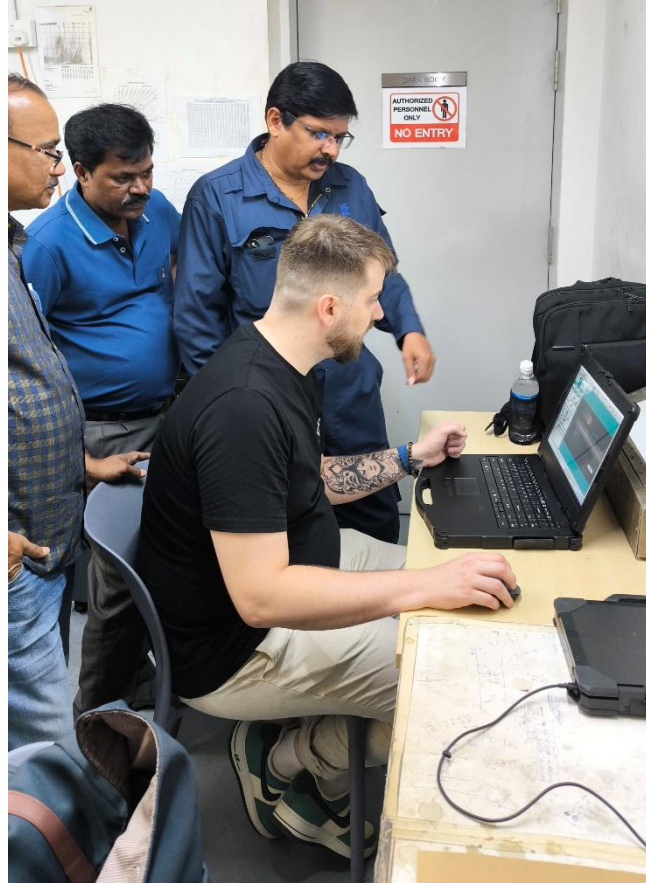
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AI-POWERED WELD IMAGE EVALUATION
FROM DETECTION TO FINAL REPORT

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DIGITAL RADIOGRAPHY IN MODERN NDT

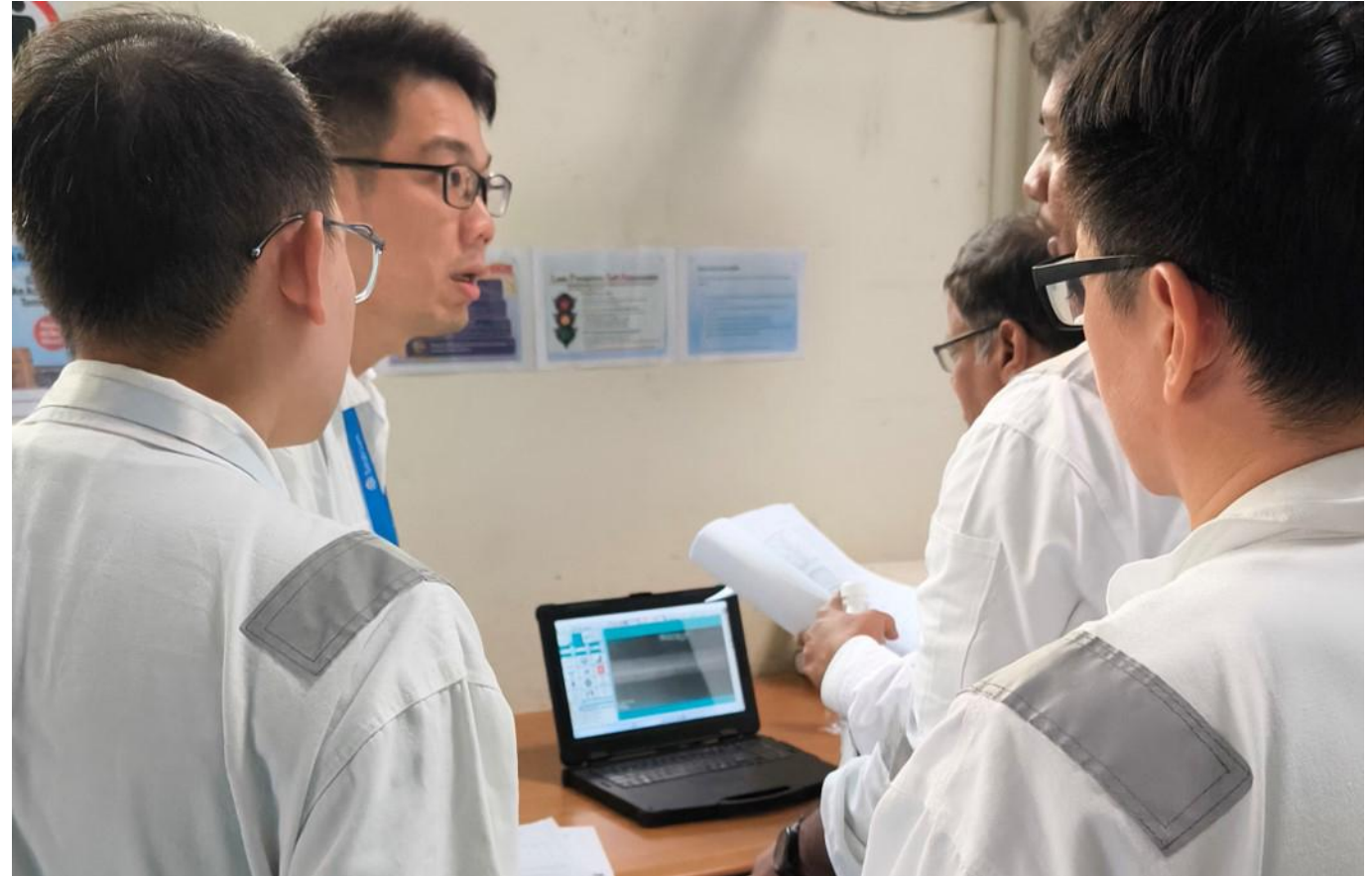


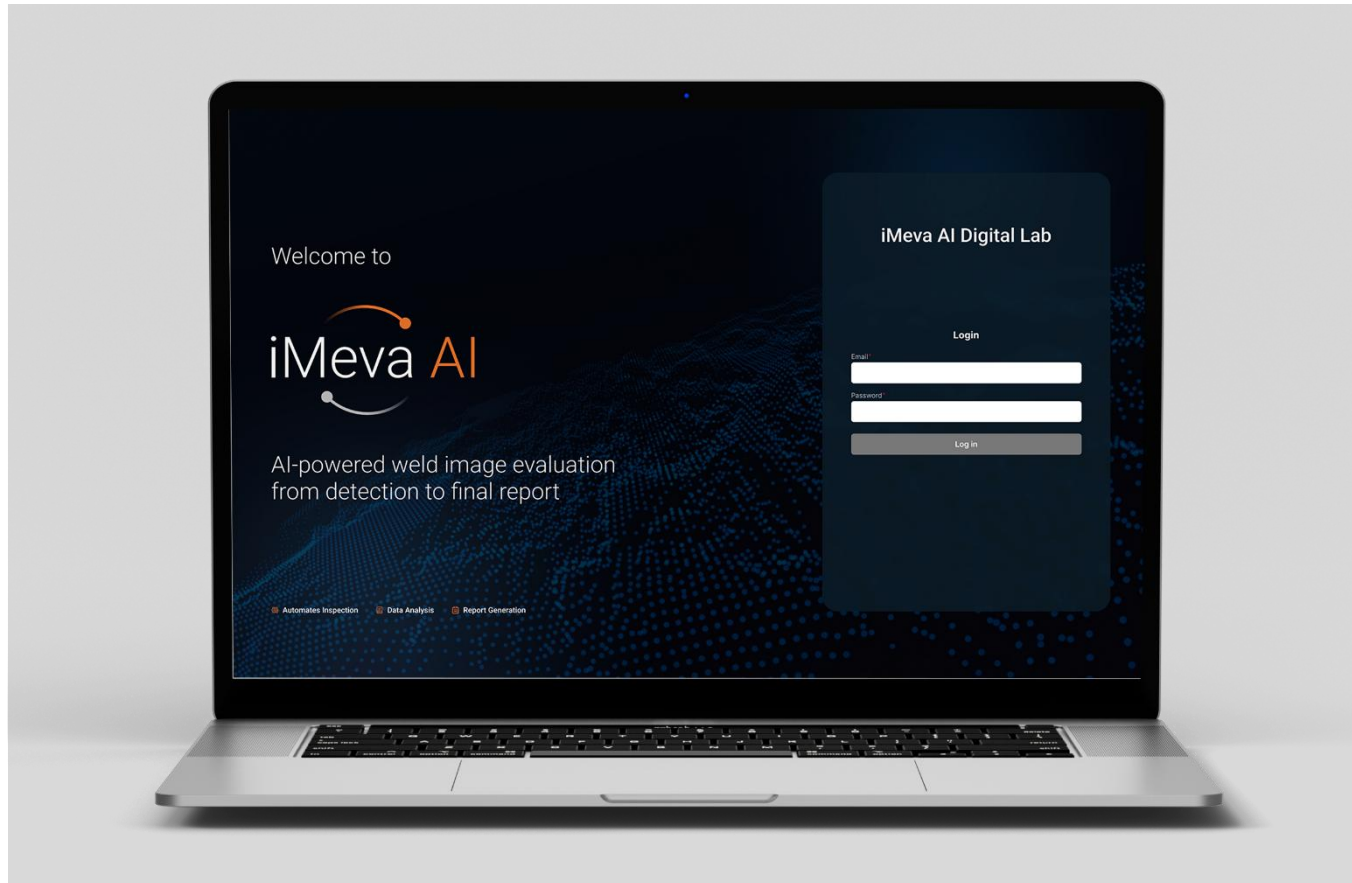
Digital radiography has become a widely adopted method in non-destructive testing, as it enables direct acquisition and immediate analysis of radiographic images. Compared to conventional film-based techniques, it eliminates delays associated with processing and significantly improves inspection over image quality and exposure parameters.

While digital systems have significantly improved image acquisition, one of the most time-consuming and resource-intensive stages remains unchanged — image interpretation and reporting still rely heavily on human expertise.

In real inspection workflows, this leads to:

- Limited throughput of inspections and reporting.
- Strong dependence on individual operator experience.
- Variability in evaluation results.
- Significant labor costs.
- Difficulty maintaining consistent quality at high volumes.
- Lack of structured and scalable digital data across projects.

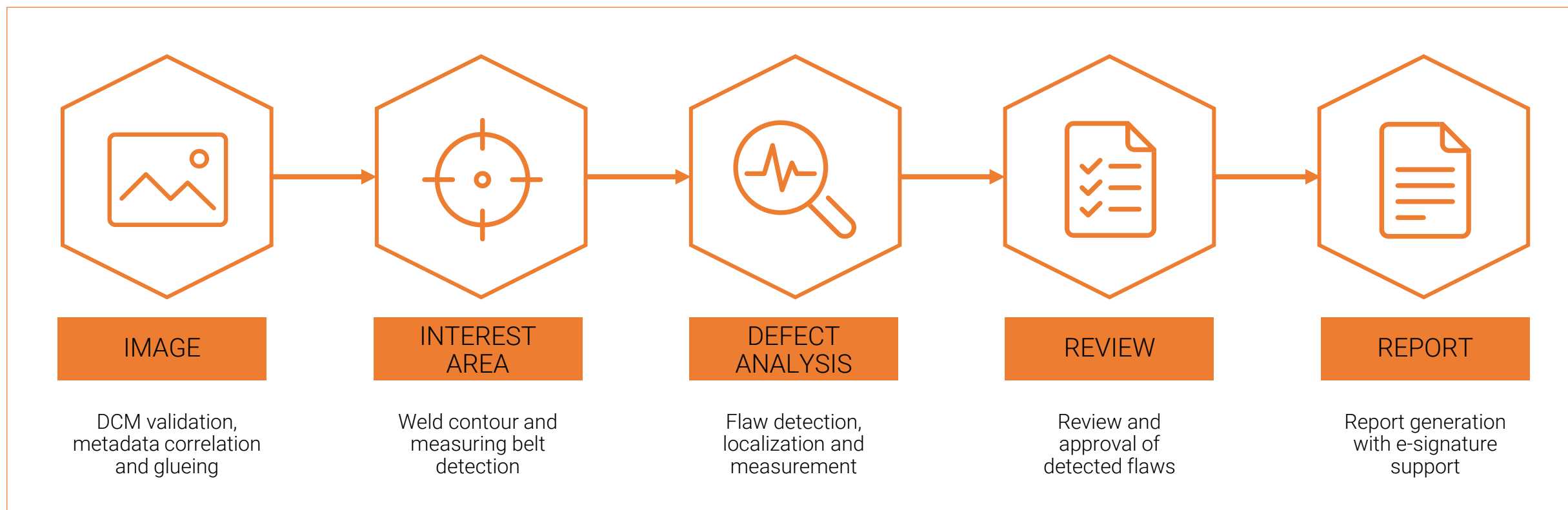




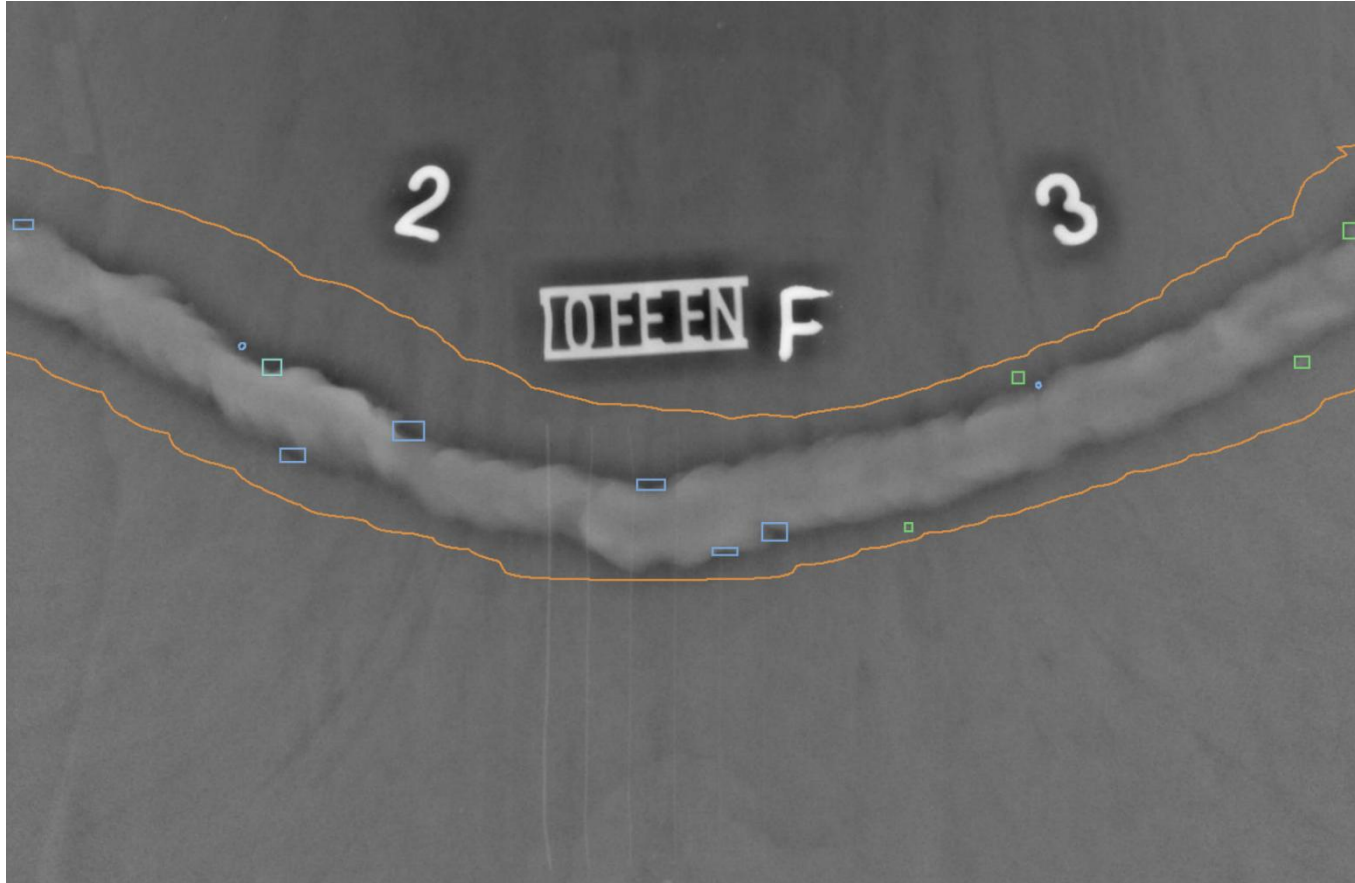
iMeva AI is a standalone software module designed to automate the interpretation of digital radiographic inspection data, improving the efficiency, consistency and reliability of non-destructive testing.

Powered by Computer Vision and Deep Learning technologies, the system delivers end-to-end automation of the radiographic image analysis process, significantly reducing manual effort and interpretation time.

END-TO-END AUTOMATED EVALUATION FROM IMAGE TO FINAL REPORT



FLAW TYPES DETECTED BY IMEVA AI PER ASME B31.3



- POR — porosity
- CP — cluster porosity
- HB — hollow bead
- UC — undercut
- IUC — internal undercut
- IF — incomplete fusion
- IC — internal concavity
- BT — burn through
- IP — inadequate penetration
- C — crack
- IFD — incomplete fusion (cold lap)
- SLG — slag indication
- TI — tungsten inclusion
- IPD — inadequate penetration due to high-low
- AD — accumulation of discontinuation

iMeva AI automatically generates a structured testing report, consolidating all inspection data into a standardized format.

The report includes weld identification, object and inspection parameters, imaging conditions and a list of detected indications with their classification, physical location and dimensions. Weld quality is assessed in accordance with ASME B31.3 acceptance criteria.

All indications remain fully editable, allowing the operator to review and refine the results before approval. The final evaluation remains the responsibility of the qualified specialist.

				Digital Radiographic Examination Report		Report No.: 4	
Date of Examination:		05.04.2026		NDT Log No.:		32	
Client:		DR-Systems		Contractor:		DR-Systems	
Project:		Demo		Location:		UAE	
Procedure No. & Rev.:		Proc-01		BI / JO Number:		222	
Acceptance Criteria:		ASME B 31.3		Referencing Code/Specification:		SAEP-1143	
Material:	CS	PWHT:	NA	Surface Condition:	As Welded	Weld Process:	GTAW+SMAW
SOD:	300	ODD:	273.1mm	X-Ray Equipment or Isotope Type:	Eresco 42MF4		
IQI Type:	ISO	IQI Set:	10FEEN	Focal/Source size:	2.8 mm		
Reinforcement:	2 mm			Kev/Activity:	30	mA:	2.0
Required Sensitivity:	0.2			No. Of Exposure:	6	Exposure Time:	35
Achieved Sensitivity:	0.15			Detector Make/Model:	Scanray 1025F		
IQI Placement:	Detector Side			Imaging Software:	DR-SOFT 002.984		
Location Marker:	Detector Side			Detector Sr. No.:	NQDB001	SNRN:	>98
SWSI (PLATE) SWSI (PANORAMIC) SWSI (PIPING) ✓ DWSI DWDI (EL) DWDI (SI)							
Item Description / Line No. / Dwg. No.	Weld No.	Welder No.	Size/Dia. Thk./Sch.	Segment	Findings		Accept/Reject
Demo line / Demo Line / 3445	FW-Sa_RS	WELDER1	10X9.27	0-6	POR@0; POR@1; POR@2; POR@2; LF@2; UC@3; UC@5; SLG@5; POR@5; POR@6; UC@6; UC@6		Rep
				6-12	POR@6; UC@6; POR@7; POR@9; CP@9; POR@10; POR@10; POR@10; POR@11; POR@11; POR@11		Rep
				12-18	LF@13; LF@13; LF@14; LF@15; UC@16; UC@17; SLG@18		Rep
				18-24	UC@20; UC@20; POR@21; POR@21		Rep
				24-30	POR@25; POR@26; LF@29; UC@29		Rep
				30-34	SLG@30; SLG@30; POR@32; POR@33; UC@33; POR@33		rep
Legends: ACC - Acceptable REP - Repair REJ - Reject CO - Cut Out NSD - Non Significant Defect SOD - Source to Detector Distance VC/VT - Visual Check / Visual Test IFD - Incomplete Fusion (Cold Lap) C - Crack POR - Porosity CP - Cluster Porosity SLG - Slag Inclusions TI - Tungsten Inclusions IPD - Incomplete Penetration (High Low) IF - Incomplete Fusion IP - Incomplete Penetration BT - Burn Through UC - Undercut, IUC - Internal Undercut IC - Internal Concavity EP - Excess Penetration HB - Hollow Bead FM - Film Mark SD - Surface Depression RS - Reshoot RT - Retake P - Penalty							
Radiography Performed By							
Interpreted and Evaluated By		Reviewed & Approved By		Client Acceptance By			
RTFI		Client's Representative		Client/Contractor			
Name:	Sam Smith	Name:		Name:			
NDT Level:	NDT Level 3	Designation:		Designation:			
Signature:		Signature:		Signature:			
Date:	15.04.2026	Date:		Date:			

- Up to 150-200 inspection reports per day compared to 30-50 with manual evaluation.
- Isolated solution with no transfer of sensitive data outside the customer's infrastructure.
- Precise measurement of flaw dimensions and automatic calculation of their coordinates.
- Reduced manual effort, enabling higher inspection throughput without increasing personnel requirements.
- Advanced database management with role assignment and full traceability of user actions.
- Reliable detection of flaws starting from 0.1 mm, enabling the identification of very small indications.
- High defect classification accuracy, reaching up to 96% for dependable assessment results.
- More consistent and objective interpretation of images, minimizing the impact of subjective human judgment.
- User-friendly interface with filters, measurement and visualization tools for efficient review of detected flaws.
- Faster turnaround between inspection and final report generation.

MEASURABLE IMPROVEMENTS IN EVALUATION

PROPERTIES	Conventional workflow	iMeva AI module
Average evaluation time per image, minutes	15-20	2-3
Error rate due to human factors, %	Up to 30	Less than 5%
Number of images processed per shift, pcs	30-50	150-200
Report generation speed	Up to 1 day	Instant
Access to statistics and archive	Limited, local	Centralized, online
Decision traceability	Partial	Full

Express Image Processing

SCANRAY 1025F, steel pipe 159×7 mm, Ir-192, class B (w15, D10).DCM

Weld Seam Detection

Done

Radiographic Image Quality Evaluation

Done

Defect Detection

Done

Tape Marker Recognition

Done

Defect Offset Calculation

Done

Restart

Open Image Editor

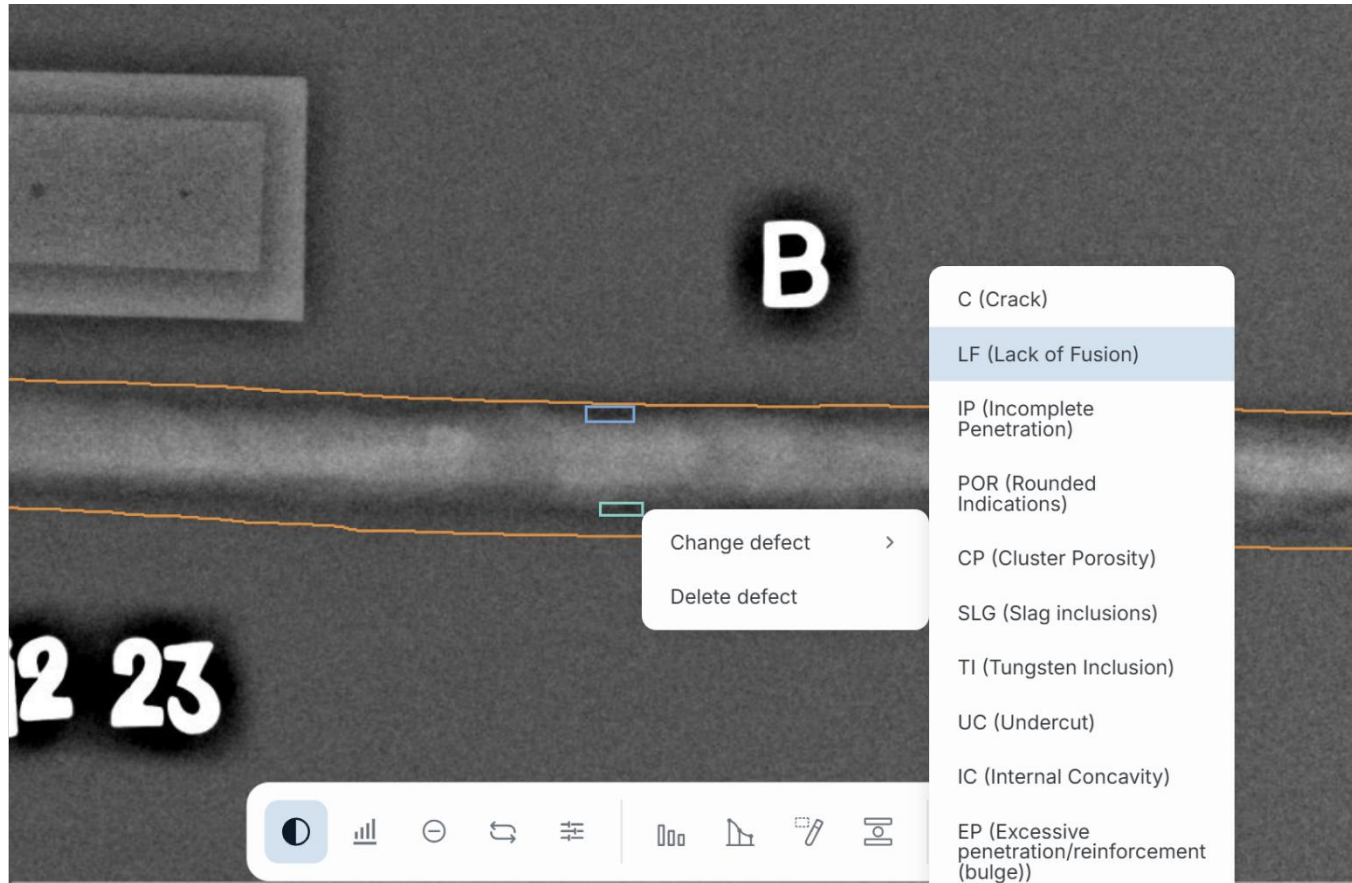
Wide and highly representative dataset

iMeva AI has been trained on more than 380,000 labeled radiographic images, including over 120,000 defect samples covering a wide range of flaws. Continuous dataset expansion and model refinement further enhance detection accuracy and reliability.

Expert-validated training dataset

All annotations are created in accordance with a unified standard derived from relevant industry codes and regulatory requirements. The training dataset is subject to a comprehensive three-stage verification process performed by qualified operators, experienced Level III DR specialists and independent top-tier experts, ensuring the highest level of data quality and consistency.





Thorough accuracy evaluation

To ensure an unbiased evaluation of system performance, the dataset is split into dedicated training and validation subsets. The qualification process involves thousands of radiographic images, with all results independently reviewed and cross-validated by leading NDT experts.

Specialized training algorithm

The neural network is trained using a dedicated learning approach that gradually increases the complexity of training tasks, improving detection performance and generalization. Particular attention is given to validation results after every model retraining iteration.

BOX SOLUTION

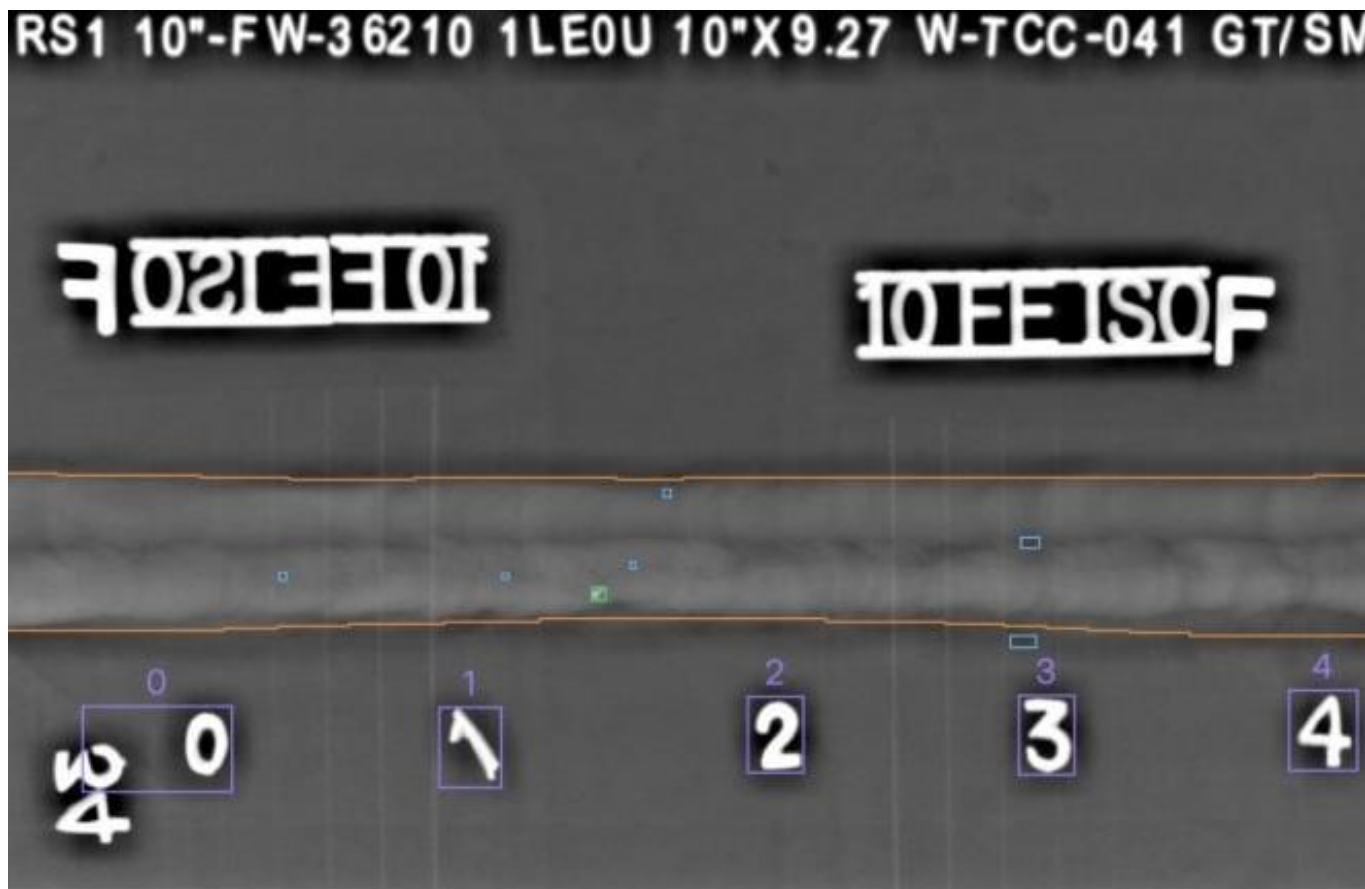
Designed for standalone use on a local workstation, the box solution provides automated image analysis and report generation in a simple and ready-to-use format. It is focused on improving the speed and consistency of daily inspection tasks without requiring complex setup or integration.



ENTERPRISE SOLUTION

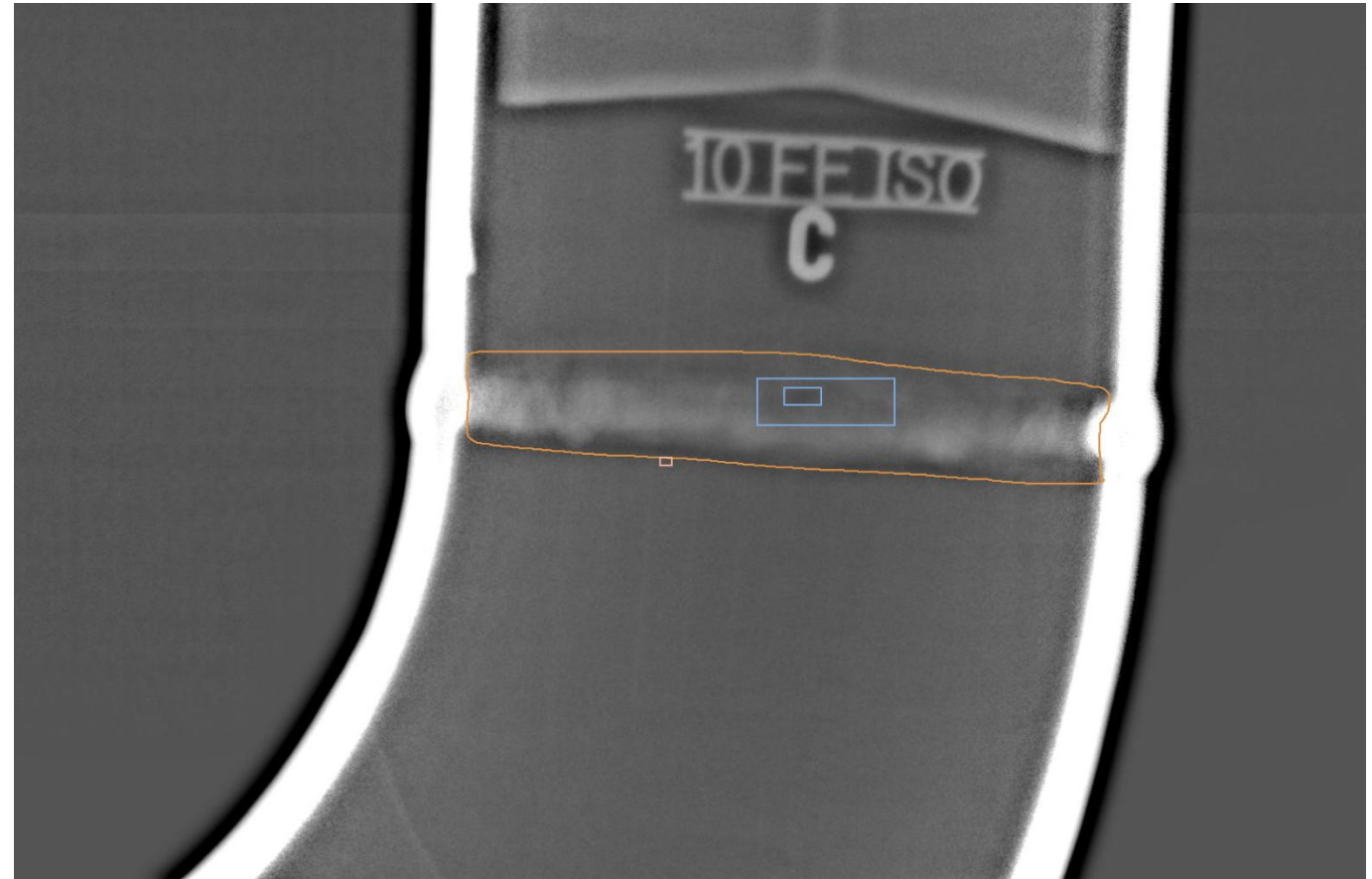
Designed for large-scale operations, the enterprise solution is built on a server-based architecture with centralized data management. It supports distributed workflows, real-time data synchronization, task and role management, integration with external systems and flexible customization to meet specific customer requirements.

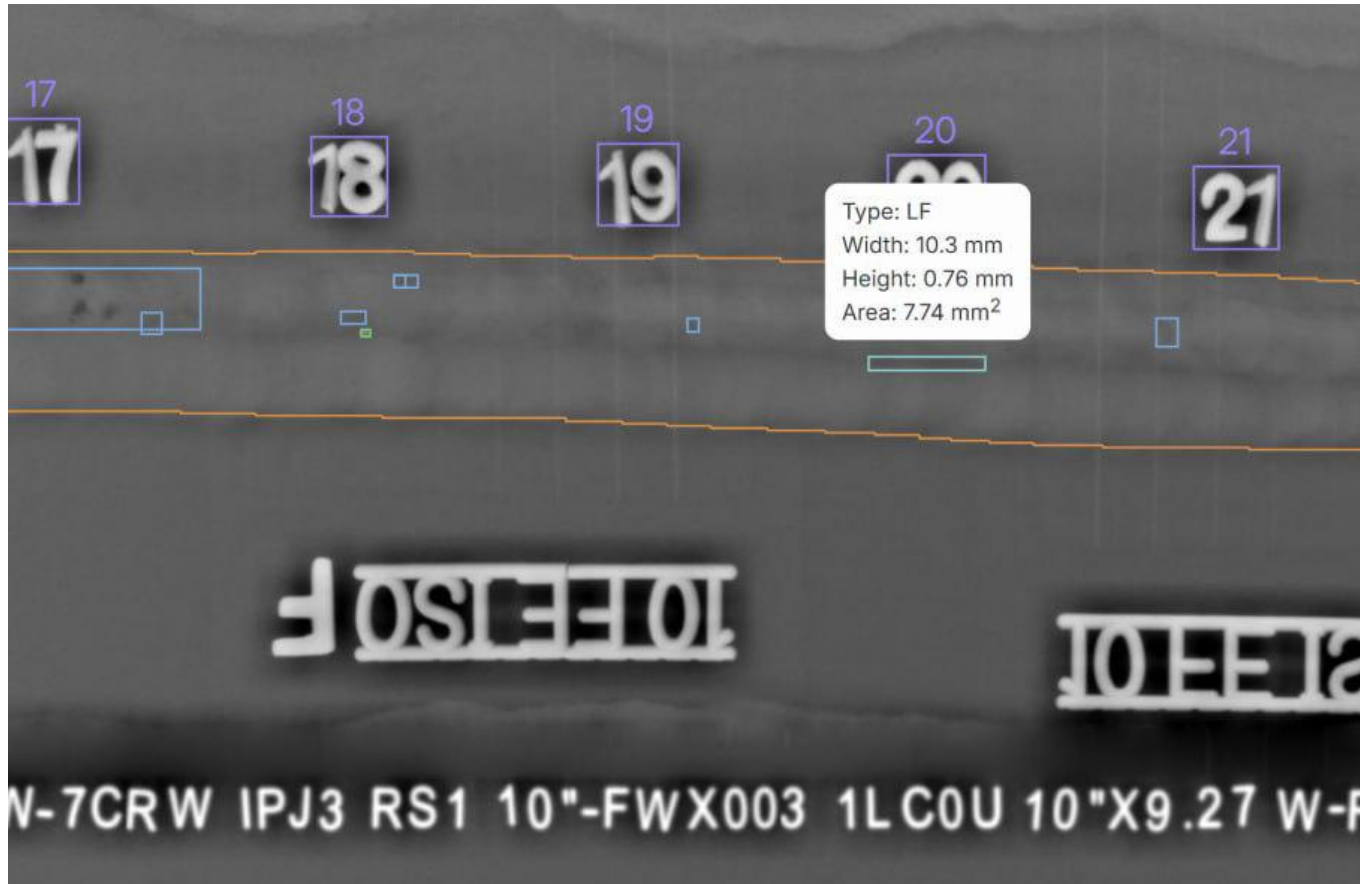




- Object: steel pipe 10 inches, 9.27 mm thickness.
- Source: Comet EVO 200D.
- Exposure: 15 frames by 2.5 seconds.
- DWSI scheme.
- Image quality achieved: W15 (0.125 mm).
- Achieved results with iMeva AI: automatic weld and measurement belt recognition, flaw detection, localization and sizing.
- Defects:
 - UC × 3, average length of 3.5 mm;
 - TI × 1, size 1.5 × 0.7 mm;
 - POR × 8, size of 0.5 × 0.5 to 0.7 × 0.7 mm.

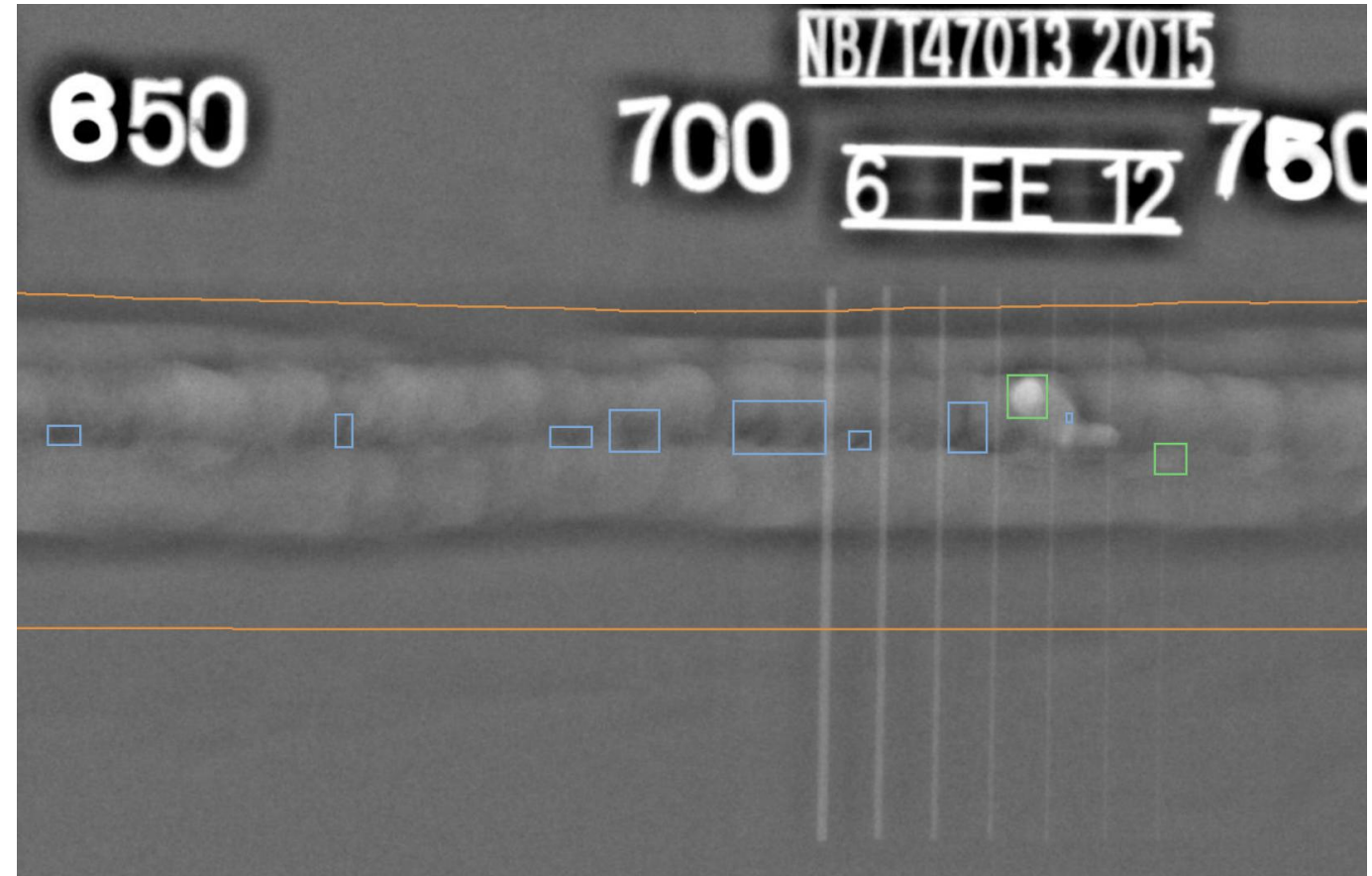
- Object: steel pipe 3 inches, 5.49 mm thickness.
- Source: Ir-192.
- Exposure: 10 frames by 10 seconds .
- DWDI scheme (superimpose technique).
- Image quality achieved: W13 (0.200 mm).
- Achieved results with iMeva AI: automatic weld recognition, flaw detection and sizing.
- Defects:
 - UC × 1, size 4.56 × 1.6 mm;
 - IC × 1, size 17.9 × 6 mm.

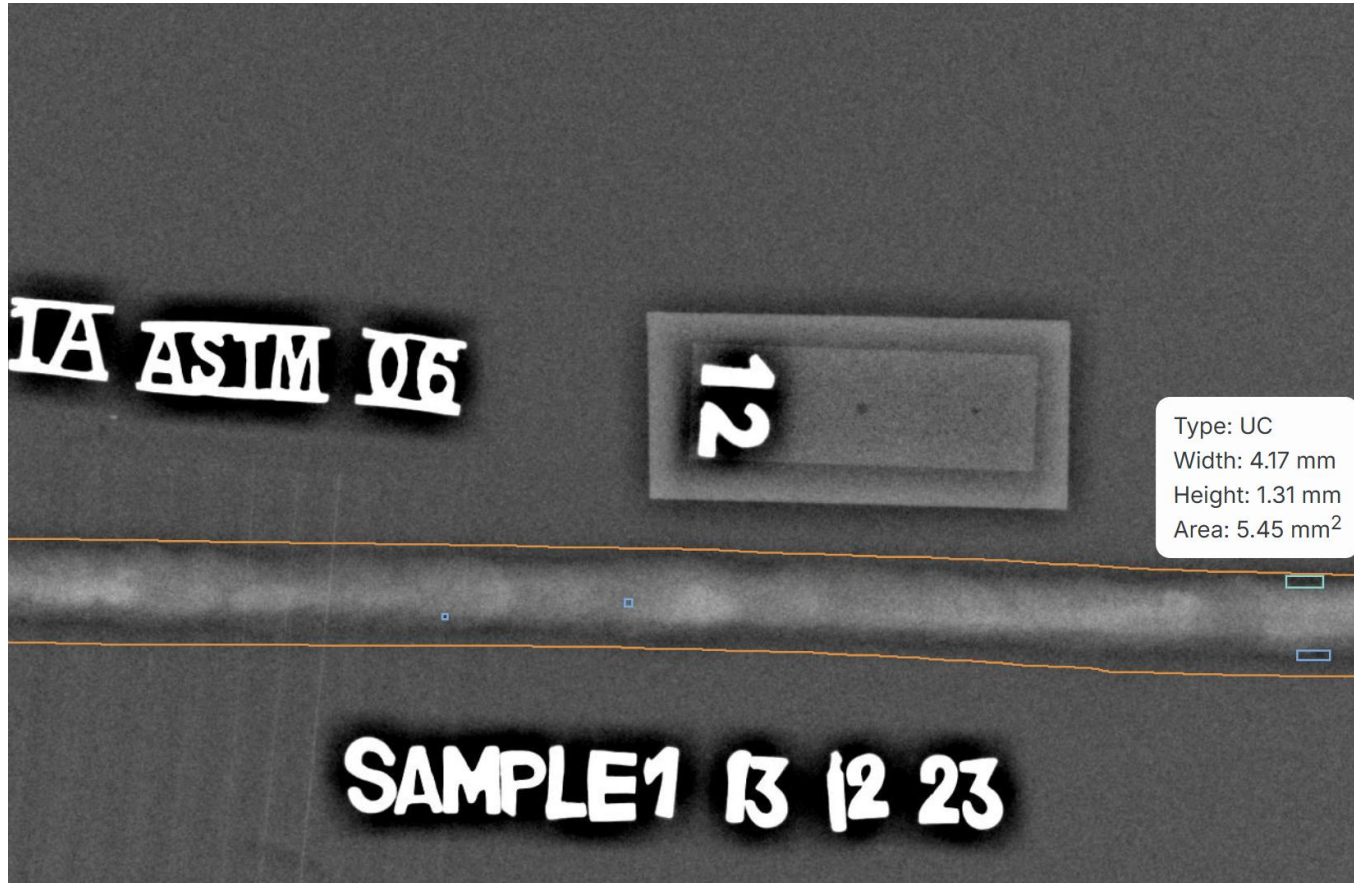




- Object: steel pipe 10 inches, 9.27 mm thickness.
- Source: Comet EVO 200D.
- Exposure: 6 frames by 10 seconds .
- DWSI scheme.
- Image quality achieved: W14 (0.160 mm).
- Achieved results with iMeva AI: automatic weld and measurement belt recognition, flaw detection, localization and sizing.
- Defects:
 - LF × 2, length 10.3 and 7.9 mm;
 - SLG × 2, size 2.2 × 1.1 mm;
 - POR × 5, size of 1.1 × 1.1 to 2.2 × 2.2 mm.

- Object: steel pipe 36 inches, 11.06 mm thickness.
- Source: Dandong Aolong XXG-3005.
- Exposure: 3 frames by 36 seconds .
- DWSI scheme.
- Image quality achieved: W12 (0.250 mm).
- Achieved results with iMeva AI: automatic weld recognition, flaw detection and sizing.
- Defects:
 - UC × 2, size 2.87 × 1.68 and 3.66 × 1.78 mm;
 - SLG × 2, size 1.49 × 2.87 and 1.88 × 1.58 mm;
 - IC × 3, size of 4.36 × 3.66 to 8.12 × 4.65 mm;
 - POR × 2, size 0.6 × 0.6 and 0.8 × 0.8 mm.





- Object: steel plate, 6.19 mm thickness.
- Source: Golden Engineering XRS3.
- Exposure: 1 frame by 15 seconds .
- SWSI scheme.
- Image quality achieved: W4 (0.160 mm).
- Achieved results with iMeva AI: automatic weld recognition, flaw detection and sizing.
- Defects:
 - UC × 2, size 4.17 × 1.31 mm;
 - POR × 3, size of 0.6 × 0.6 to 1.19 × 1.19 mm.

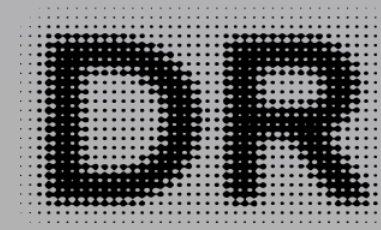
LET'S EXPLORE IMEVA AI TOGETHER

We would be happy to show how iMeva AI works in real inspection scenarios and how it can support your daily workflow.

During a live demonstration, we can explore the system in more detail and discuss its application for your specific tasks and requirements.

We are also open to pilot projects and practical evaluation in real working conditions.





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We are open for cooperation!

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