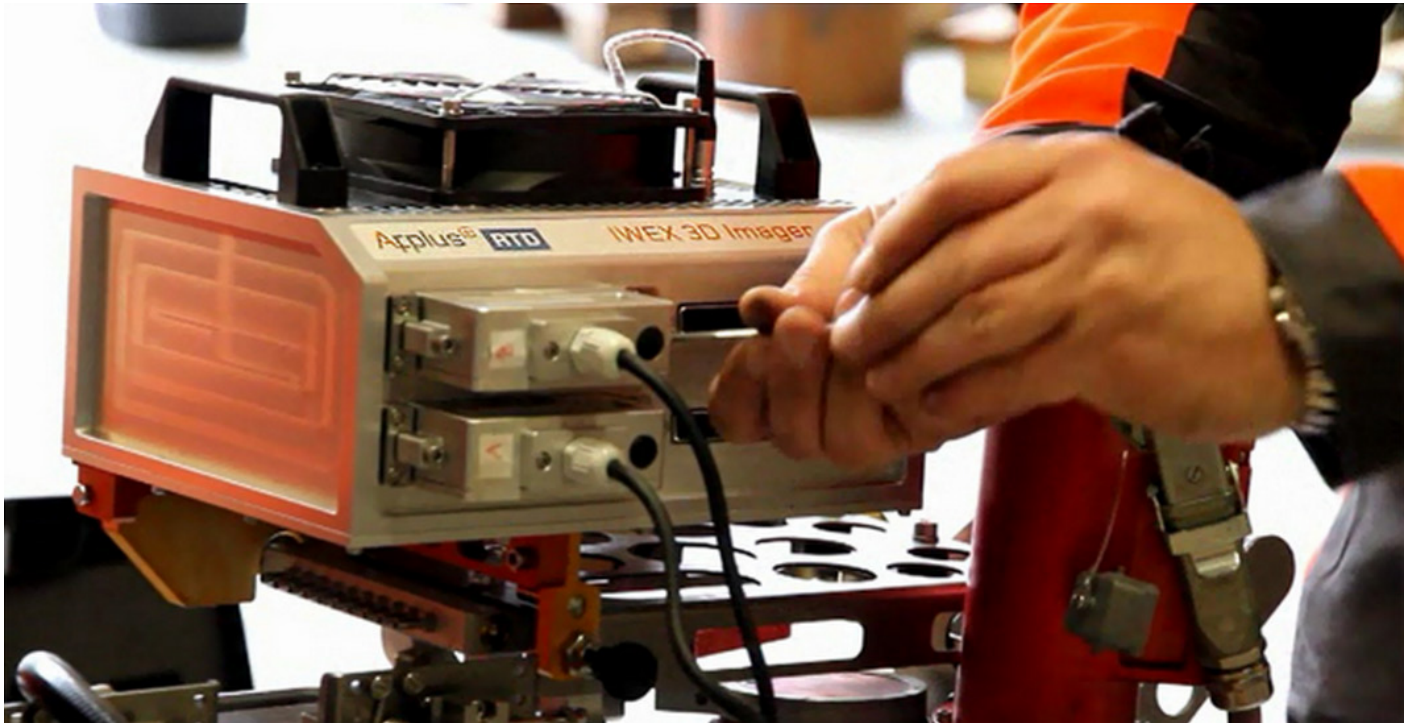


# IWEX 3D Imager

## NDT & Inspection

A new way of UT defect detection and presentation.

Inverse Wave field EXtrapolation (IWEX) is an emerging novel ultrasonic testing technique that shows great potential in both defect detection and characterization, combined with a simplified presentation of inspection results due to an imaging approach. This technique is currently being implemented in the Applus RTD IWEX 3D Imager.



### The major advantages of IWEX are:

- Straightforward interpretation that is less dependent on operator skills and calibration blocks;
- Reliable detection and accurate sizing, less dependent on defect orientation than existing UT techniques;
- IWEX image is directly linked to defect properties.;
- Improvements have been introduced that allow for imaging of defects in the near surface, in a weld with cap and root or perpendicular to the surface;
- Defects with various orientations are imaged by combining both direct insonification and indirect measurements via the back wall.
- Better and easier means of defect detection and characterization will ultimately lead to less repair and maintenance costs.

IWEX is a novel ultrasonic testing method whose development was initiated by Applus RTD in 2004. The result of this emerging technique is an actual image of the inspected volume, rather than a plot of the collected signals. The main advantage of this technique is a comprehensive visual representation of the defect, which can be used for accurate characterization in terms of size, position, and orientation. Additionally, the IWEX methodology allows for data visualization in both two and three dimensions (see figure 1).

From the 2D image, it can directly be seen that the IWEX approach provides an intuitive visualization, and as a view comparable to the cross section of the weld is obtained. Defect characterization is relatively simple, as the scale is given in distance perpendicular to the weld [mm] and depth [mm]. This means that defect position, size and even orientation can directly be found from the output image. The 3D visualization provides great insight in the defect position and size with respect to the weld.

**Applus RTD**

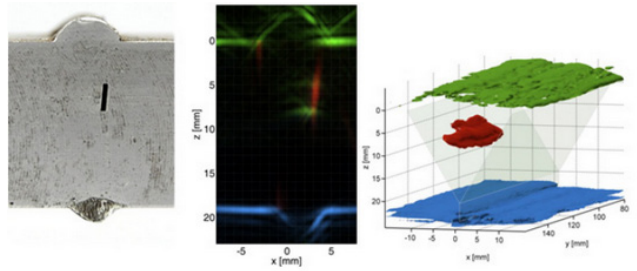
Applus RTD provides the following services as individual packages or combined to provide a total Asset Integrity Management programme.

- Advanced (non-intrusive) Inspection Services
- Sub-sea Inspection Services
- Engineering Design Solutions
- Risk Based Inspection Planning
- Inspection Management Services
- In Service Inspection
- Plant Life Management
- Metallurgical Services.

Importantly, Applus RTD can also call upon extensive in-house expertise and resources for advanced inspection and conventional NDT, providing a total capability for management of through life plant integrity.

Applus RTD, in collaboration with our local and international partners, has extensive experience in the application of these services to a wide range of industries including:

- Oil & Gas
- Petrochemical
- Refining
- Ore Processing and Handling
- Power Generation.



*Figure 1: Left: Artificial defect; middle: IWEX image of artificial defect; right: 3D IWEX image of a lack of fusion defect*



*IWEX 3D Imager mounted on the AUT RTD RotoScan system*

