

#### Industries & Market

- Petrochemical
- Gas & Pipelines

#### Typical Parts

- Pressure vessel
- Heat Exchanger
- Pipeline
- Steel works

#### Technical Inspection

- Phased Array
- Encoded Data Recording
- L-SCAN with IFT
- BOX EXTRACTOR
- C-SCAN & TOP VIEWS
- MERGED VIEW

### Brief Description

Hydrogen blistering usually occurs in 'sour' systems where oil or gas contain large amounts of hydrogen sulphide. At high temperature when hydrogen atoms diffuse into the steel, hydrogen molecules then form an internal defects or inclusions that usually migrate to become a small delamination. Over time, this can form voids or 'blisters' which may eventually generate enough pressure to rupture the metal.

Inspecting using Phased Array L-SCAN gives an unambiguous means of detecting regions of hydrogen blistering. BOX EXTRACTOR, C-SCAN & TOP VIEW functions are powerful tools to detect and give a clear indication of size/shape of the

blistered region. The fast PRF and 2D encoding capacity of VEO gives the opportunity to quickly scan a significant area of the part and duly package UTDATA into a comprehensive 2D MERGED view. UTDATA can be analysed and report generated directly on the instrument, or in the comfort of the office using Sonatest PC- based software UTStudio (raw data can also be exported to CSV for customized analysis/report).

Although similar results could be achieved with a Sonatest Mastercan or Sitescan conventional flaw detector, the speed and probability of detecting small blistered regions are greatly improved using Phased Array technology.

### Features and Benefits

- Greatly improves probability of detection and enhances scan coverage & execution time
- Full data recording and archiving (traceability)
- 2D-MERGED views offer comprehensive result
- BOX EXTRACTOR simplifies setting up on the part & zone discrimination in UTDATA analysis
- Advanced custom analysis possibility (raw data)

#### RECOMMENDED TOOL PACKAGE

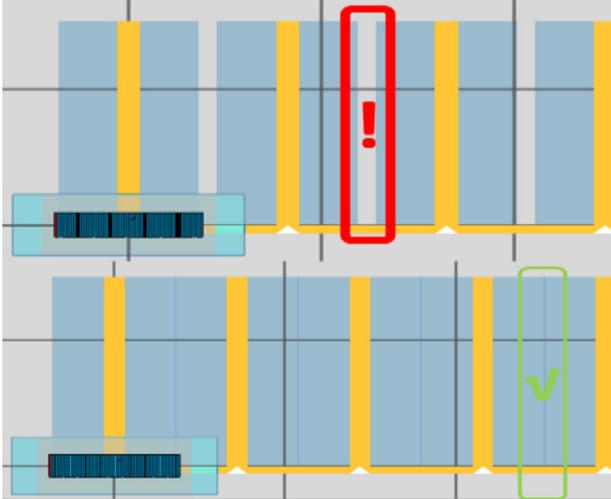
- VEO 16:64
- UTStudio software
- QuickTrace encoder
- Probe & Wedge: – T5-5.0M64E0.8P (DAAH type)  
– T5-25.4WOD (Other option: WheelProbe 5MHz)



# Technical & Practical Outlines

## 1. Setting up over the part:

When scanning a part zone, draw a grid representing scan plan on the part to make sure all of the part is covered. The index step should be set so there is no uncovered zone between lines into Encoder View.



Software will automatically calculate the quantity of passes to cover the area defined into Encoder menu Scan & Index distance. The scan coverage width of the probe is a function of the Nb Active Elmt (Scan menu) forming each focal law (< Element, > coverage & reverse).

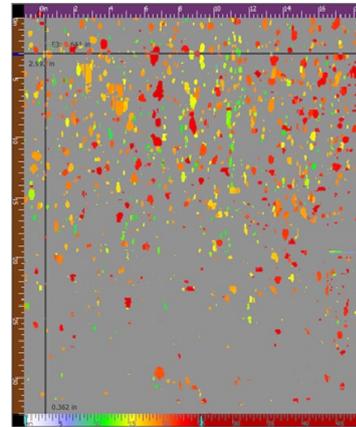
## 2. UTDATA acquisition:

Calibration should be done following local requirements. A calibrated TCG is recommended, especially in thick and attenuative materials (ex. stainless steel or special alloy). The IFT function is also recommended.

For a fast setup and result, BOX EXTRACTOR is the simplest tool to use with L-SCAN. A scrolling TOP view is recommended during acquisition.

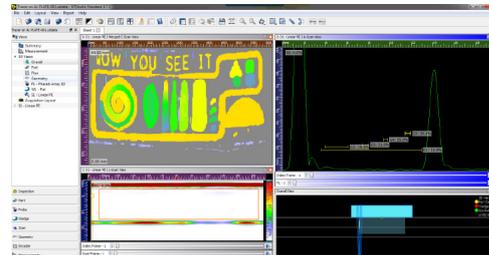
## 3. UTDATA analysis using instrument:

MERGED TOP view is recommended for post-analysis. By moving the BOX EXTRACTOR within the part thickness, the user can generate reports of blisters presence in specific thickness zones. UTStudio is recommended for large area analysis.



## 4. UTDATA analysis using UTStudio:

A MERGED TOP view is recommended for post-analysis. Specific zone discrimination of the part thickness can also be produced by using a dedicated BOX EXTRACTOR per thickness zone.



ANNOTATIONS function is another useful tool to generate automatic statistical analysis of a defective area. Finally, useful RAW data (thickness and/or amplitude) can be exported to a CSV format file for advanced custom analysis of the results.

Get in touch with our local Sonatest expert, available in more than 50 countries over 5 continents!



**Sonatest (Head Office)**  
Dickens Road, Old Wolverton  
Milton Keynes, MK12 5QQ  
t: +44 (0)1908 316345  
e: sales@sonatest.com

**Sonatest (North America)**  
12775 Cogburn, San Antonio  
Texas, 78249  
t: +1 (210) 697-0335  
e: sales@sonatestinc.com