



Comparison Table Between EMI / FLUT / FLUT Phase Array / Technical Industries Inc. Visonic.

	EMI	FLUT	*FLUT Phased Array	VISONIC TM 3D Imaging
1. Detection capability (Standard API detection capability longitudinal, transverse & wall thickness)	Yes	Yes	Yes	Yes
2. Detection capability (Exceeding API Including oblique defects and wall thickness measurement)	No	Yes	Yes	Yes
3. Ability to inspect both non-ferromagnetic and ferromagnetic pipe	No	Yes	Yes	Yes
4. Ability to inspect API pipe range I & II & III pipe	Yes	Yes	Yes	Yes
5. Ability to inspect pipe below 10' short pipe and coupling stock	No	No	No	Yes
6. Ability to inspect 1" and over wall thickness pipe for heavy weight drill-pipe and coupling stock	No	No	No	Yes
7. Coupling between transducers and pipe	Good	Good	Poor	Good
8. OD Pipe size inspection capability	2-3/8" - 14"	2-3/8"- 20"	2-3/8"- 20"	2"-26"
9. Wall thickness over 0.430" penetration capability	No	Yes	Yes	Yes
10. Standard chart defects & wall thickness graph display capability	Yes	Yes	Yes	Yes
11. Wall Thickness, CSA (Cross Sectional Area) capability	No	No	No	Yes
12. Defects severity virtual imaging display capability	No	No	Yes	Yes
13. Whole pipe virtual imaging including defects & wall thickness	No	No	No	Yes
14. Whole 100% pipe virtual imaging tour including Defects & wall thickness and OD/Ovality	No	No	No	Yes
15. Simulation of tensile strength capability	No	No	No	Yes
16. Simulation of burst capability	No	No	No	Yes
17. Simulation of collapse capability.	No	No	No	Yes
18. Expandable pipe imaging including identification of failure areas.	No	No	No	Yes
19. Whole pipe image storing capability for future reference	No	No	No	Yes
20. Minimum ID imaging capability	No	No	No	Yes
21. Maximum OD imaging capability	No	No	No	Yes
22. Measuring pipe volumetric capability	No	No	No	Yes
23. Pipe identification finger printing capability	No	No	No	Yes
24. Pipe manufacturing process imaging capability	No	No	No	Yes
25. Pipe straightness imaging capability	No	No	No	Yes
26. Threads imaging capability	No	No	No	Yes
27. Networking system enabling the monitoring of the unit performance, inspection results and customers inventory	No	No	No	Yes
Proven technology	Yes	Yes	Prototype	Yes
RESULTS	5/27	8/27	6/27	27/27
* FLUT Pipe Phased Array inspection system methods are different than Shaw Group Phased Array Weld Inspection Methods. FLUT Phased Array includes the rotation of transducers or the pipe and the traversing along the length of the pipe. This method has proven to cause frequent transducers coupling loss. Therefore, causes loss of signals.				



Brief Explanation.

1. Detection capability (Standard API detection capability longitudinal, transverse & wall thickness).

Capability of detecting longitudinal, transverse flaws and wall thickness in the pipe.

2. Detection capability (Exceeding API Including oblique defects and wall thickness measurement).

Capability of detecting oblique flaws and measure the wall thickness.

3. Ability to inspect both non-ferromagnetic and ferromagnetic pipe.

Ability to inspect all pipes made of non-ferromagnetic and ferromagnetic material.

4. Ability to inspect API pipe range I & II & III pipe.

API standard ranges:

- Range I 16' to 25'
- Range II 25'+ to 34'
- Range III 34'+ to 48'

5. Ability to inspect pipe below 10' short pipe and coupling stock.

Ability to inspect pipe below 10 feet long and thick-wall coupling stock.

6. Ability to inspect 1" and over wall thickness pipe for heavy weight drill-pipe and coupling stock.

Ability to test pipes that are thick (1" inch and over of wall thickness) with thick coupling stock.

7. Coupling between transducers and pipe.

How good is the quality of the traveling signal between transducers and pipe through 3rd material called coupling (water, oil...). Loss of coupling causes the loss of the signal and therefore, produces poor inspection quality.

8. OD Pipe size inspection capability.

Pipe sizes that can be inspected, this is related to the Outside Diameter measurement of the pipe.

9. Wall thickness over 0.430" penetration capability.

Ability of inspecting pipe with wall thickness over 0.430" inches.

10. Standard chart defects & wall thickness graph display capability.

Ability to show data related to the condition of the pipe in basic Chart Graph for all defects and wall thickness.

11. Wall Thickness, CSA (Cross Sectional Area) capability.

Ability of reading and collecting the wall thickness measurements and calculating the Cross Sectional Area of the pipe, in small sections along the length of the pipe in order to determine the tensile strength of each pipe.

12. Defects severity virtual imaging display capability.

Ability to show a virtual of each defect found on the pipe and determine the severity of each defect.

13. Whole pipe virtual imaging including defects & wall thickness.

Ability to show a virtual image of the whole pipe including the defects severity, locations and ability to read the wall thickness inside and outside the pipe. Ability to stop at any desired location and view the condition and the data related to that location.

14. Whole 100% pipe virtual imaging tour including Defects & wall thickness and OD/Ovality.

Showing the whole virtual image of the pipe with defects, wall thickness and Outside Diameter measurements including précised ovality in every small section and area of the pipe.

15. Simulation of tensile strength capability.

Capability of showing and detecting the tensile strength in & on every small section of the pipe.

16. Simulation of burst capability.

Capability of showing and locating the burst area(s) in & on the pipe. This done by using engineer desired Algorithm.

17. Simulation of collapse capability.

Capability of showing and locating the collapse area(s) in & on the pipe. This done by using engineer desired Algorithm.

18. Expandable pipe imaging including identification of failure areas.

Expanding the virtual image of the pipe to show in more details the failure area(s) (flaws, defects, wall thickness, etc...).

19. Whole pipe image-storing capability for future reference.

Storing and saving the virtual image of each pipe. This is done in order to retrieve the image if needed in the future for any reason and the ability to predict the detritions rate and life expectancy of the pipe.

20. Minimum ID imaging capability.

The ability to show a clear virtual image of the whole ID of the pipe including the minimum inside diameter area of the pipe.

21. Maximum OD imaging capability.

The ability to show a clear virtual image of the whole OD of the pipe including the maximum outside diameter area of the pipe.

22. Measuring pipe volumetric capability.

Ability to measure and show a virtual image of the whole volume capacity of the pipe.

23. Pipe identification finger printing capability.

Capability of identifying each pipe and find out all its previous data and comparing previous and present data in order to determine the origin of the pipe.

24. Pipe manufacturing process imaging capability.

Capability of finding out each pipe manufacturing process from the virtual image.

25. Pipe straightness imaging capability.

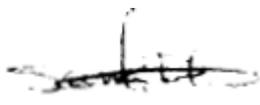
Capability of showing how straight is the pipe by its virtual image.

26. Threads imaging capability.

Capability of showing the virtual image of the pipe's Threads.

27. Networking system enabling the monitoring of the unit performance, inspection results and customers inventory.

A Network system that show a live stream of every Visonic™ unit performance, tracking every single pipe, giving instant inspection results, showing the customer inventory history and present location.

By:  _____
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