MISTRAS
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Products & Systems Division

Free Motion Scanner (FMS) System

Free Motion Scanner (FMS) System is a WIRELESS scanner that uses electromagnetic techniques for 3-dimensional tracking of a UT scanner sensor. Proprietary algorithms re-map the 3-dimensional surface, such as that represented by the pipe elbow in Figure 1, into a conventional 2-D C-Scan map of the surface showing a complete thickness map. This can also be adapted for flaw detection applications of the surface (see Figure 2).

The FMS, with its companion base transmitter (as shown), scans plate areas of approxi-mately 20 x 20 inches (.5 x .5 M) at a minimum resolutions of .010 inches (.25 mm), although larger resolutions are recommended in the interest of time.

With no cumbersome encoders, encoder mechanisms or other structural elements to get in the way, only the highly flexible receiver and UT cables are connected to the scanner body (a water line can also be used for couplant). This permits unencumbered scan geometries for curved surfaces such as elbows and tees (including variable diameters) that would be nearly impossible for more conventional scanners.

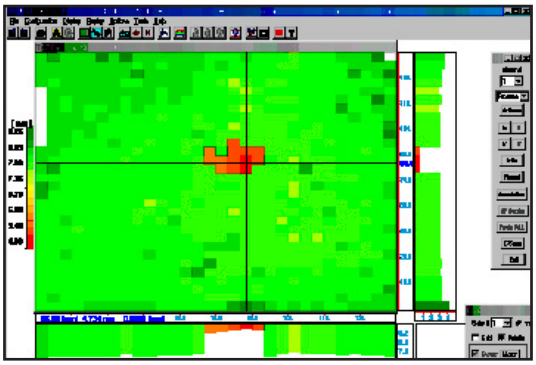

Figure 2: : C-Scan and B-Scans of Elbow showing flat-bottom hole (red).

Figure 1: Free Motion Scanner on the curve of an elbow

Advantages of this approach include:

- Speed of data collection
- Ability to inspect curved surfaces
- Adjustable scan resolution
- Ability to visualize internal flaws
- Full conventional UT data analysis capability
- Color-coded and numerical data displays
- Virtually unlimited geometry capability

Figure 2 shows the C-Scan and B-Scan color-coded thickness map of a 3-D elbow complex curve, demonstrating the geometry correction capabilities of the FMS software.

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