MISTRAS

One Source for Asset Protection Solutions

SERVICES DIVISION | SOLUTIONS BULLETIN

EMAT (Electro-Magnetic Acoustic Transducer) Inspection Services

OVERVIEW

When visual and conventional methods of corrosion and fault detection prove too expensive or impractical, MISTRAS' has the solution – Electro Magnetic Acoustic Transducer inspection services. EMAT inspection is a cost-effective solution designed for long runs of pipelines (buried, hidden or easily accessible), which can be configured to perform high-speed volumetric testing, isolated interrogation and sizing. Yet EMAT technology isn't just for pipelines.

EMAT Structural Applications

- Vessels
- Tanks
- Flat Plate
- Components

EMAT Industries Applications

- Marine
- Pipeline
- Refinery
- Chemical
- Power Generation
- Manufacturing

VERSATILITY

The versatility of EMAT technology cannot be overstated. It can test structures through a variety of methods – thickness, angle beam, guided wave and phased array – while supporting configurations for Pulse Echo or Through Transmission with small transducers (for rapid, high-speed screening) or large transducers (for precise sizing). Another benefit is the fact the EMAT does not require the application of liquid couplant.

GLOBAL ASSESSMENT TOOLS (GUIDED WAVE)

The use of guided waves allows for the detection of localized corrosion in areas of pipes (both vertical and horizontal) that cannot be reached by standard NDT methods. It accomplishes this by generating guided waves that travel either circumferentially 360° around the pipe or axially along the pipe or plate. When complete, it is able to produce qualitative information on the severity of any detected corrosion.

The most common configuration of this function is the Robotic Guided Wave, which is supported by the EMAT Circumferential scanner – a remote-control scanner configured with two probes in a pitch/catch arrangement. This has been proven in detecting faults such as: corrosion, erosion, material defects (laminations, inclusions, etc., and micro-biological corrosion (MIC). While guided waves propagate in both directions around the pipe, the system records data from various signal frequency modes, which allows for high-speed volumetric inspection along the circumference of the pipe. The Robotic Guided Wave function has been proven effective for inspecting thousands of feet of pipe per day, both large and small in diameter (20-30 ft) and pipe supports.

BENEFITS

- High temperature range (up to 600˚C)
- Requires no couplant or significant surface preparation
- Transmit through most standard coatings and light surface rusting
- Operates at high speed and high sensitivity
- 100% volumetric inspection – ID, OD and center of wall
- Diameter range of 1"-36"
- Scans up to 550 yards (500m) of pipe per day
- Capable of detecting wall losses of 10% or grater
- Ability to find very small defects

Inspection Capabilities

- Thickness
- Corrosion
  - Touch Point
  - Interface/penetrations corrosion
  - Pitting
  - Erosion
  - Microbial Induced Corrosion (MIC)
- Hydrogen Blistering
- Cracking
  - Stress Corrosion Cracking (SCC)
  - Long Seam Cracking
  - Girth Weld Cracking
  - HAZ
- Coating Integrity

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