



BETTER INSPECTIONS WITH ALTERNATING CURRENT FIELD MEASUREMENT, EVEN IN DANGEROUS LOCATIONS

Non-destructive testing is an essential service that helps ensure the health and safety of both humans and the environment. Being able to reliably report on the integrity of the capital infrastructure all around us remains critical. With advances in technology, there is no excuse to depend on the archaic forms of asset integrity assessment – especially given that collecting this invaluable data potentially places workers in harms way... a complete contradiction to the goal of non-destructive testing evaluations.

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THE CHALLENGE

Identify an alternative to avoid the substantial preparation in the way of paint or coating removal and surface cleaning required for magnetic particle inspection to help determine the remaining useful life of an asset.

2

THE SOLUTION

Alternating current field measurement continues to replace magnetic particle inspection across many applications with its ability to work through coatings and provide more reliable data for informed repair processes.

3

THE BENEFITS

Readily available integrated on a miniature, mobile inspection robot, alternating current field measurement can be performed at heights or within confined spaces without risking worker safety.

The Challenge

When magnetic particle inspection is performed on large assets like aboveground storage tanks to validate the fitness-for-service of fillet welds, lap joints, and other critical components, there is the requirement for the costly removal of any protective epoxy coatings present. The burdensome process demands extensive surface cleaning to provide any reliable results for non-through-wall defects.

Access for inspection presents another obstacle when complete coverage of what can be enormous assets like gas storage spheres,

also known as Horton spheres, is necessary. The additional expense of erecting scaffolding or hiring specialized rope access technicians adds to the cost of inspection. Beyond the economics, it forces work at heights and/or within confined space entries.

Moreover, all the effort required for magnetic particle inspection still yields dismal results as the technique is unable to provide definite depth information for any defects found. Without this critical information, it becomes extremely difficult to effectively plan repair or replacement activities.

The Solution

Specifically designed to detect and measure surface-breaking defects through several millimeters of non-conductive coating, the Alternating Current Field Measurement, or ACFM®, technique is rapidly replacing conventional inspection methods like magnetic particle inspection for a range of applications. Giving consideration to the associated costs of removing and re-applying paint or coatings to tanks, towers, vessels, and/or pipework, the cost efficiency gains of ACFM is extraordinary. In general, jobs performed by alternating current field measurement are six times less expensive than the same work performed with magnetic particle inspection.

With these cost efficiencies comes higher productivity coupled with high Probability of Detection, or PoD. For reference, a 152-meter (600-foot) weld on a painted structure takes six days with magnetic particle inspection versus one and a half days with alternating current field measurement. New array probe technology offers a minimum of five times faster inspections compared to previous ACFM probes, also minimizing operator fatigue. The high-speed probe is ideal for tank floor and shell joints. At the end of the inspection campaign, a comprehensive report detailing auditable crack length and depth information is created which enables a proactive risk management program.



Left to right: Gas sphere inspection, fillet weld inspection, tank floor weld inspection

The Benefits

To further promote worker safety, ACFM technology can be integrated with mobile robots to access the difficult-to-reach locations encountered during large asset integrity evaluations. Standard commercial offerings by Eddyfi Technologies pair remote visual inspection with alternating current field measurement for inspecting cracks that often develop in high rising structural steels. This unmanned solution provides complete coverage without coming at a cost to inspector safety. Contact us to learn more today.



Internal vessel inspection



Magg ACFM®

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