

Remote field Eddy current testing.



Background

Tubes of heat exchangers are mostly inspected qualitatively by visual means. When quantitative information about defect depth, extension into the tubes, et cetera is required, Eddy current technique is predominantly the most suitable answer. For non-ferromagnetic tube materials like copper alloys, titanium, stainless, et cetera) this is a well-developed technique to provide all required data in a comprehensive way. The application on steel tubes, however, mostly calls for specific solutions: every defect type and location (near baffles or at the tube ends) might lead to another approach, sometimes also involving ultrasonic techniques or a combination of techniques.

Conventional Eddy current testing is hardly suitable to inspect carbon steel tubing and tubes made of other ferromagnetic material. Remote Field Eddy Current Technique (RFT) is many times the solu-

tion to this problem. The shielding effect of the inner tube wall is less dominant than the one with the conventional Eddy current testing. KEMA has also been exploring the possibilities of applying this technique for the purpose of inspecting small gas pipes, incoming into houses and other buildings. Those pipes are sometimes poorly merged into concrete floors and therefore susceptible to corrosion.

To establish the type of corrosion and severity more accurately than by means of standard Eddy current testing, KEMA developed the ROTEC system to map the tube wall. With its flexible surface riding capability the ROTEC system is especially suitable for certain steel tubing, such as finned economizer, evaporator and air cooler tubes. At a later stage the system was redesigned to negotiate curved tubing, as sometimes present in boiler tubes; this system has been named GROTEC.

Services

- Extremely deep and rough seam weld penetration
- Obstructions, such as threaded elbows and sharp-curved, flattened bends



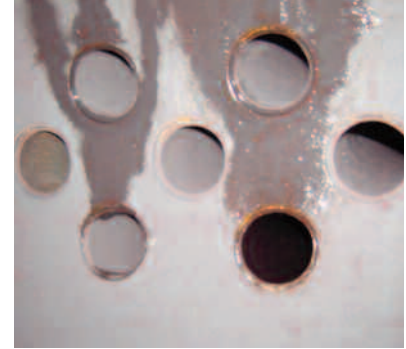
- The requirement of manipulating a probe into a gas-filled pipe, while the pipe is connected to the main gas

pipe under pressure

- The necessity to negotiate all obstructions and rough weld penetration and full recovery of the probe on the one end available.

Benefits

- Quantitative method
- Corrosion and erosion types of attack can be displayed accurately: possibility to pinpoint 'counter measures'
- Recorded data, yielding trending possibility: degradation progress can be monitored
- Strong visualisation method to support management decisions: repair/replace or continue
- Last resort to non-destructive testing of flaws in certain types of tubes



- Accurate assessment of wall thickness loss (in 0.01 mm)
- For gas pipe applications: prevention of dangerous leaks in and near buildings and houses
- Virtually no limitations to tube length
- Virtually no change of missing "abnormalities"
- Short testing time.

For more information:

KEMA
P.O. Box 9035
6800 ET Arnhem
The Netherlands
T +31 26 3 56 35 00
F +31 26 4 42 87 13
contact.tos@kema.com
www.kema.com