

REFORMER TUBE INSPECTION



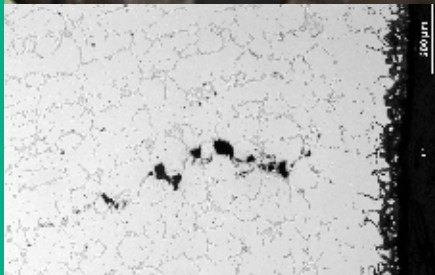
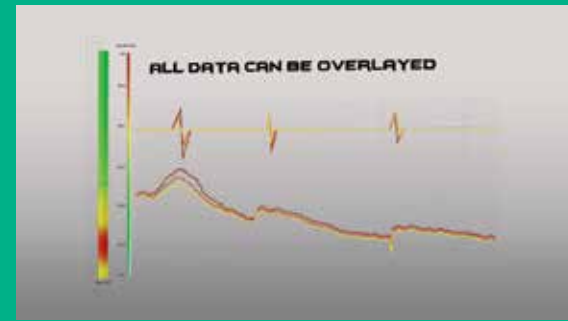
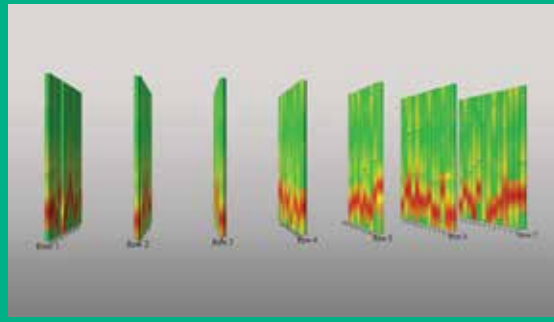
LEO - SCAN

Laser Eddy current Outside scanning of Reformer Tubes



Member of
FOERSTER GROUP

Our mission is to prevent unplanned shutdowns of SMR based reformer operations by providing LEO-SCAN, Undisputedly the best choice in reformer tube inspection.

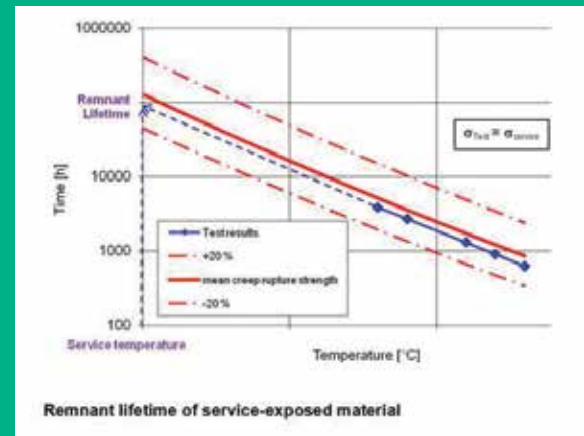
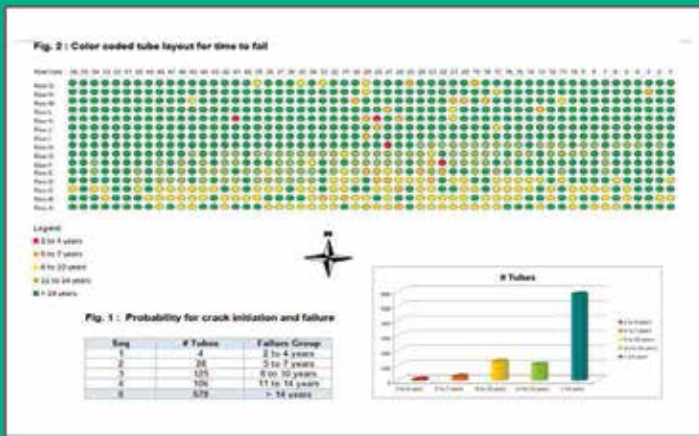


INTRODUCTION

The pioneer in using electromagnetic test methods, Friedrich Foerster, was the founder of INSTITUTE DR. FOERSTER. Today, FOERSTER has many subsidiaries and a multitude of representatives in all over the world, specialized in all kind of eddy current testing. Magnetische Pruefanlagen GmbH (MP) belongs to the Foerster Group and has been inspecting reformer tubes for more than 30 years with their proprietary eddy current based systems. During this time MP has serviced more than 300 customers in more than 60 countries. Currently, MP carries out more than 120 inspections annually.

REFORMER TUBE INSPECTION FROM THE OUTSIDE

Introducing LEO-SCAN - the MP eddy current system for the inspection of reformer tubes from the outside. LEO stands for Laser Eddy current Outside scanning. It is important to note that all probes, mechanical parts and test instruments are either built by MP, or built to the specifications of MP by others. This sole source, in-house approach is why the LEO-SCAN system is the most proven and accurate system in use today. The eddy current crack detection system of LEO-SCAN penetrates the complete tube wall in the search for cracks that could lead to failure. The



LEO-SCAN system also utilizes dual axis laser diameter measurements to measure diametrical strain. The starting point for collecting the data is only 20 mm from the floor. The LEO-SCAN can easily inspect 250 tubes per shift with or without catalyst in the tubes.

CRACKS WITH OR WITHOUT MEASURABLE STRAIN

There are several different reformer designs, such as top-fired, floor-fired, terrace wall, side-fired and circular designs. In each case there is an area where damage normally is found. Based on the tremendous experience of the inspectors, these problem areas are given extra scrutiny.

LEO-SCAN will detect damage that occurs due to normal operating conditions as well as other events, such as flame impingement, catalyst issues, loss of flow, spring support issues and flue gas distribution issues. These abnormal conditions can distort the relationship between creep-strain and cracking.

BASELINE INSPECTIONS

MP encourages clients to perform a baseline inspection on new tubes. This baseline inspection can find abnormalities in the tubes, such as machine gouges, hot tears and other issues. It also provides a “fingerprint” of each tube for later comparisons.

REPORTING

All damage is presented to the client in tabular and graphic 3D formats. These views can show the operators where the trouble or high heat areas are in the reformer and allow for diagnosis and correction of these problems. All data can be overlaid and compared due to the amazing repeatability.

REMAINING LIFE ASSESSMENT

The data, coupled with plant operational data, can be used for a remaining life study should the client desire it. MP works with several very experienced third party metallurgical specialty companies to assist in any high-level assessment work on an independent basis.

Why choose the
MP's LEO-SCAN
crack detection system?



Pioneer in Eddy Current testing method

30 years experience in reformer testing with more than 120 inspections annually

More than **300 satisfied clients** in more than **60 countries**

Experienced engineers with up to 25 years experience

The system probe **penetrates the complete tube wall** up to 25mm

The starting point for collecting data is only **20mm from the floor**

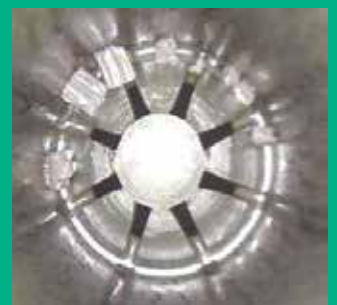
Extreme repeatability and accuracy

MP's LEO-SCAN is undisputedly the best choice

www.mp-nat.de

Other Services:

- ID Inspection of Reformer Tubes
- Pigtail Measurement



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