

LEO-iSCAN

Internal inspection of centrifugally cast reformer catalyst tubes



ID measurement with multiple lasers and EC

A sophisticated new inspection device developed by FOERSTER is now available: LEO-iScan. Having proven itself both rugged and reliable in field use, it encompasses a powerful laser unit that very accurately measures the inside diameter (ID) combined with an eddy current (EC) system.

The inspection is carried out starting at the top of the tube flange and continuing all the way down to the catalyst support grid. This is possible only when the catalyst is removed from the tubes. Since the inside surfaces of the reformer tubes are machined, these readings easily show creep growth even in the absence of previous (baseline) data.

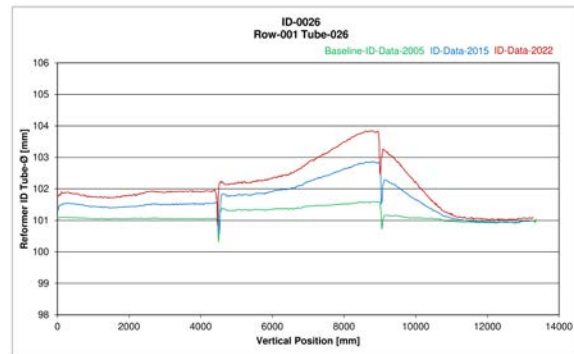
The benefits

- **Precise detection of the three damage scenarios in reformer tubes**
 - Cracks without diametrical growth (thermo-shock or strong short-term overheating)
 - Diametrical growth (long-term overheating)
 - A combination of both
- **Proximity of the probes to the site of potential creep damage** (approx. 1/3rd from the ID surface)
- **Accurate laser system** to gain a full picture of the tube's ID
- **Possibility of**
 - monitoring creep damage below the floor
 - monitoring tubes inaccessible from the outside
- **Full repeatability** of EC and Laser measurement
- Possible **problematic areas** inside the furnace **can be revealed** out of the inspection results
- **Helpful for eliminating the causes** leading to damage and tube failures

LEO-iSCAN - Reliable internal tube inspection

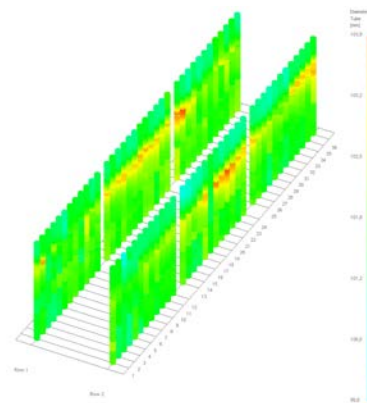
The only inside scan with Eddy current

As the probe descends the tubes, proprietarily designed EC probes record signals for evaluation. Not only does the system record the variations in electrical conductivity & magnetic permeability, but more importantly, the system processes and continuously monitors them, thus allowing the EC system to detect cracks and defects within the tube wall and the surface of the ID. The LEO-iScan has a very high repeatability which allows a high accuracy for comparing subsequent datasets.



Inner diameter measurement with four-axis laser system

The LEO-iScan device uses a four-axis laser system to measure the ID of the tubes over their entire tube length from the top of the reformer down to the catalyst support grid. ID measurement is an important test for identifying creep expansion. The use of lasers for this inspection ensures repeatability and allows the tube inner diameter to be recorded over the complete tube length. The results show the tube internal diameter in a 3D, 360° view. This information can be presented for single tubes, single rows, or the entire reformer.



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