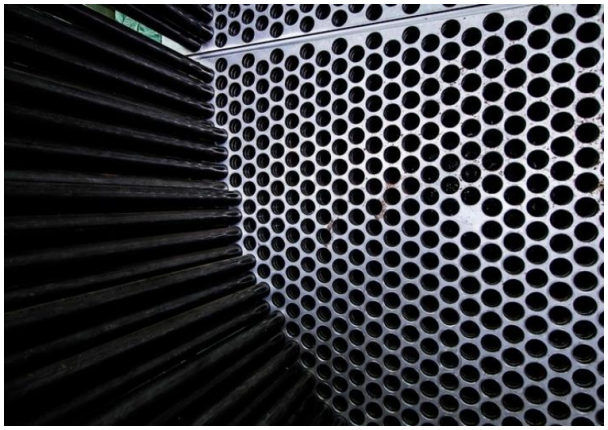
Contact: info@applus.com

IRIS Inspection - Internal Rotating Inspection System

IRIS (Internal Rotary Inspection System) is an ultrasonic inspection technique developed to measure the wall thickness of tubes from the inside. It can be applied to a wide range of materials like stainless steel, carbon steel, duplex steel, copper alloys, and more. Typical applications include the inspection of heat exchanger tubes, fin-fan tubes, and boiler tubes. It can be used in addition to or instead of one of Applus' tube inspection techniques: eddy current, RFT, or PSEC.



THE Applus+ SOLUTION

IRIS Inspection Procedure

The probe used in IRIS examination consists of a centring device, an ultrasound transducer, and a rotating mirror. An ultrasound pulse is generated in the axial direction of the tube by the transducer. Then, a 45-degree mirror in the probe directs the sound bundle towards the tube wall. Next, an ultrasound reflection (echo) will be observed at the inner and outer walls of the tube. These echoes are detected and processed; knowing the sound velocity in the tube material, the time between the echoes represents the wall thickness of the tube at that particular spot. By rotating the mirror, the wall thickness of the full tube circumference can be measured. Water is used to rotate the probe mirror and acts as a couplant to conduct the ultrasound between the transducer and the tube wall. Because the principle is based on the reflection of ultrasound, the tubes should be cleaned to an acceptable standard.

IRIS advantages

With IRIS, the wall thickness of a wide range of tubes can be measured accurately. The measured wall thickness can be presented as a colour-coded C-scan. This not only provides information about the remaining wall thickness but also gives an impression of the defect morphology. However, IRIS is only one of the possible solutions Applus+ can provide for inspecting heat exchanger tubes. Depending on various parameters, such as tube material, tube size, and the type of defects to be detected in the tubes, the optimal solution can be chosen. This can be IRIS, as well as Eddy Current, Remote Field Testing, Partial Saturation Eddy Current, or a combination of any of these. Compared to the other techniques, IRIS is often more accurate, but also slower. Therefore, it's often combined with one or more of the faster techniques and used as a tool for verification and fine-tuning.

Defect indications are assessed immediately on-site and entered into the reporting software. As a result, we can typically provide a report with test results immediately after the inspection is completed.

Target customers

IRIS tube inspections can be deployed in any sector that uses heat exchangers, boilers, or finfan coolers, including the petrochemical, power generation, pharmaceutical, industrial air-conditioning, commercial heating units, and food industry.

Key customer benefits

Benefits of IRIS testing on tubes include high accuracy and reliability, as well as detailed information about the measured wall thickness. IRIS provides detection and sizing of internal and external wall loss, and the possibility to detect both gradual wall thinning and localised wall thickness reduction in one scan. Other benefits of IRIS include its wide application range and immediate test results.