



Heat Exchanger Inspection – IRIS

Tubular Heat Exchangers are vital to the operation of a plant.



Failures are considered unacceptable both economically and environmentally. Failure is usually caused by corrosion or erosion of the tube wall. Regular inspection is the best means of detecting wall loss at an early stage.

Brief Description

IRIS is an ultrasonic system that scans and measures the remnant wall thickness along the full length and circumference of tubes. IRIS uses an immersion pulse-echo technique. The probe is centred in the tube to be inspected and ultrasonic pulses are transmitted along a path parallel to the tube axis. These pulses are then redirected radially to the tube wall by a 45° mirror.

The mirror rotates at high speed and scans the ultrasonic beam around the tube circumference. Successive pulses build a screen image of the tube cross section at any given point.

By withdrawing the inspection head from the tube at a pre-determined rate the ultrasonic beam is made to describe a helical path, the individual revolutions producing a continuous series of measurements covering the full surface area of the tube.

Capabilities

- Inspection of ferrous and non-ferrous tubes, ranging in size from 12.5mm to 75mm internal diameter.
- The system provides accurate wall thickness measurements.
- Provides 100% coverage of tube circumference.
- Sensitive to both internal and external defects.
- Typically, 10-12 tubes can be inspected per hour, dependant on tube length.
- Defect position can be located in relation to tube length.
- Data storage of test parameters and screen image.

“Making a Visible Difference”



Limitations

- Poor surface preparation or deposits may affect ultrasonic coupling.
- Will not detect tight, vertical planar defects.
- Only applicable to straight tube lengths.
- Access may be required to both ends of the tube.

Preparation

The bore of the tube must be cleaned to bare metal along the full length for optimum results. This generally requires the tubes to be cleaned by high pressure water jetting.

Services Required

- Adequate provision for personnel and equipment access.
- 110V AC electricity supply.
- Ready access to a clean, cool water supply.