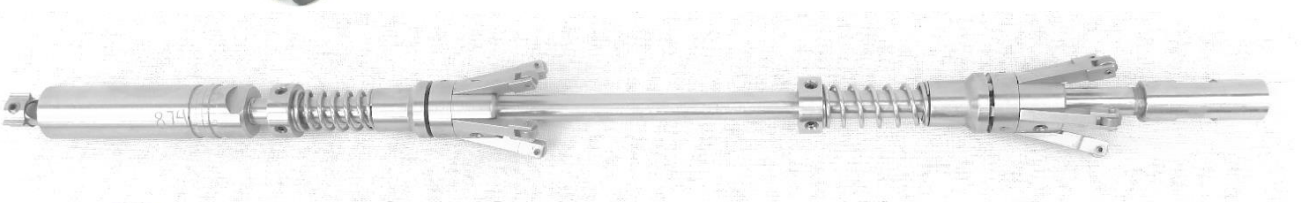
Application Note IRISXR®

in collaboration with Pan American Industries

The internal rotary inspection system IRISXR® probes combined with SG NDT's **S_2G_2** is the newest technical combination made possible by a partnership with Pan American Industries. It is ideal for a taste of both worlds.

The IRISXR system gathers data utilizing the ultrasonic pulse/echo technique inside the tubing probe.

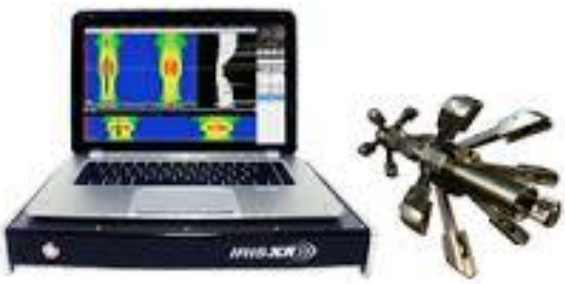


Use ECT to detect tube defects and use IRISXR to identify the suspect indications. IRISXR will give actual wall thickness information. The IRISXR tool currently provides a range from 8.3mm ID through to 1200mm ID. Inspections are performed separately, but the software will allow data to be viewed on the same platform. Typical IRISXR inspection of a heat exchanger will be about 100/120 tubes per shift.

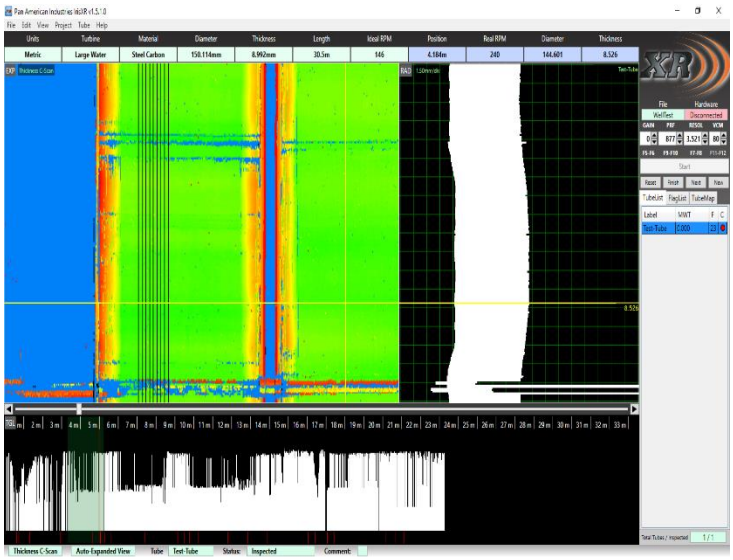
IRISXR operates in a Windows environment and is very easy to setup and run. The operator manual is very comprehensive and shows setup, data scans, and reporting. IRISXR does not require any security or dongle keys to operate.

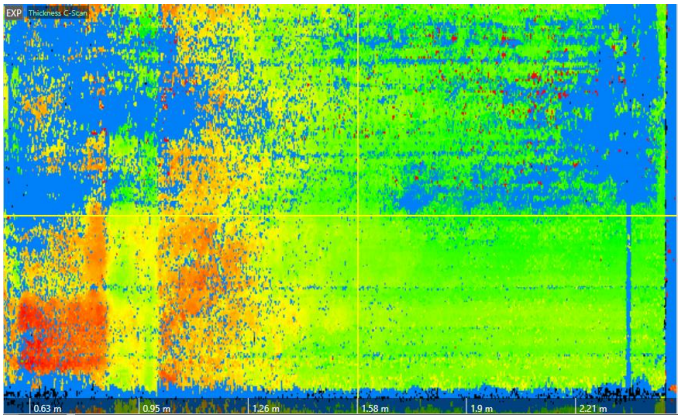
Data gathered from each tube is automatically saved to a file and can be revisited and interpreted anytime during or after inspection. Reporting on previously conducted analysis is produced through the IRISXR program.

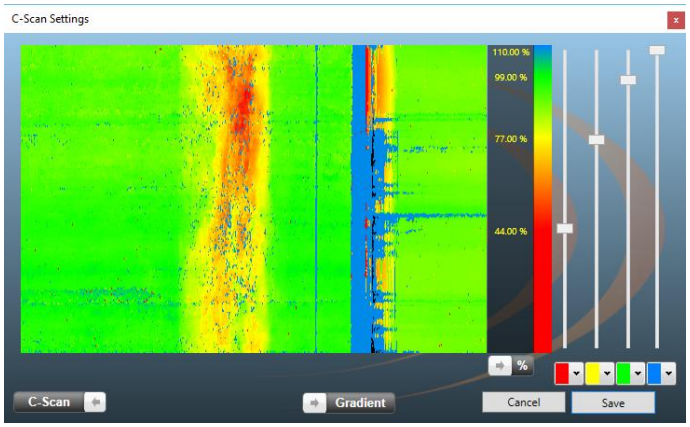
IRISXR works on both ferrous and non- ferrous metals and requires a medium such as water or equivalent to be used as a couplant for the ultrasound.



Data are relatively easy to analyze for inexperienced people – The ID/OD wall profile is shown together with wall thickness and a real-time C-Scan. Internal and external corrosion, pitting, denting, bonded scale and ovality can be easily identified.







What is the Internal Rotary Inspection System (IRIS) technique?

IRIS is now commonly used for inspections of tubing up to 6" diameter. The internal rotary inspection system uses an immersion pulse-echo technique.

The Ultrasonic transducer is housed in a turbine head with a rotating 45* mirror. The turbine is powered by water and this also acts as a couplant for the signals to the tube wall. The turbine assembly is centered in the tube axis. The ultrasonic pulses are emitted parallel to the tube axis and are reflected by the 45˚ mirror so that they are directed radially into the tube wall. The reflections from both the inner and outer tube walls follow the same path to the transducer. The signal from the inner wall reflection starts a timer that is stopped by the signal from the back wall (second) reflection. The time interval between the first wall echo (front) and second wall echo, (back) is the measure of wall thickness. As the mirror rotates, the ultrasonic beam sweeps the entire circumference of the tube wall. Normally there are around 360 firings per revolution. The firings for each revolution are "stacked" together to give a rectilinear "B" scan display of the circumferential scan. Typical Scan Width is 0.0625". ID and OD anomalies are easily recognized, and wall thickness is measured directly from the screen with measuring cursors.

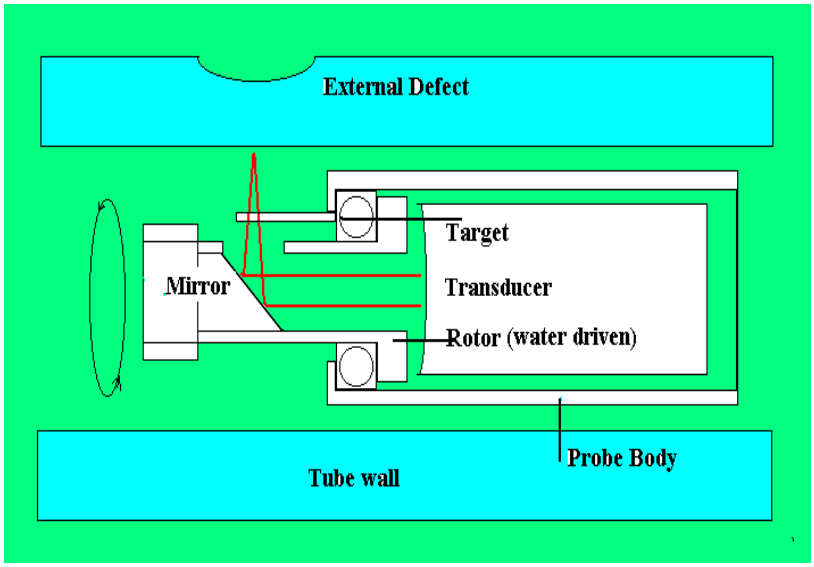
Turbine speed and PRF are adjustable to allow inspection pull speeds of up to 5m per minute.

Inspection is occurring in real time. The probe can be stopped in one location and moved back and fourth over a defect if the operator wants to resolve it further.

Iris is used for condition monitoring in tubes so that the client can be given useful information about a unit's reliability. If tubes are showing a lot of wear, the client can take measures to prevent an untimely and costly shutdown or budget for repairs at the next turnaround.

IRIS operator has the option to record data scans at the time of the job. Tube maps can be created post inspection with thickness data saved during the inspection. Data is saved to Hard drive automatically and can be reviewed on any type of computer utilizing Windows software.

Probe lengths are normally 15m & 30m and the equipment can be operated up to 200m from test unit.



Turbine Drawing