

High Temperature Automated Phased Array

Advanced ultrasonic inspection

Although most ultrasonic flaw detection and thickness gauging is performed at ambient environmental temperatures, there are situations that require inspections be completed at elevated temperatures. This is a common requirement in process industries where high-temperature pipes or tanks are inspected while on-line.



The system is specifically designed to operate at elevated temperatures and is used to evaluate the condition, particularly corrosion and weld inspections, of ferrous structures including storage tanks, pipelines, pressure vessels, and other critical equipment.

FEATURES

Inspects 4 in diameter pipe up to flat plate

Inspects temperatures from ambient up to 662°F / 350°C

100% coverage of inspection area

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The ES TempMaster Automated Scanner kit, specifically designed to operate at elevated temperatures, is used to evaluate the condition of ferrous structures such as storage tanks, pipelines, pressure vessels, and other critical equipment. Incorporating the TempMaster wedge kit enables the operator to increase efficiency when working with high-temperature components, increasing safety, scan quality, and repeatability. The scanner is cooled by a pressurized air supply system and is controlled by a laptop preloaded with operational software.

The system provides 100% coverage in a band up to 600 mm wide, aiding in the detection of a variety of damage mechanisms including corrosion and weld defects. Corrosion is one of the petrochemical industry's leading causes of equipment failure and can require costly repair or replacement. Plant equipment and piping systems are subject to various attack mechanisms at elevated temperature, which if undetected and left unaddressed can reduce reliability. This can result in unscheduled equipment and plant shutdowns, onstream ruptures, and safety concerns.

Detecting corrosion and identifying corrosion rates while equipment is on-stream can enable engineers and operational personnel to strategically schedule shutdowns and repairs or replacements by accurately forecasting equipment life.

Wire brushing or grit blasting is generally required to expose bare metal and prepare the surface for scanning. In certain situations new and tightly adhering coated surfaces can be inspected at elevated temperatures without removing the coating.

Additional Features

- » High-temperature phased array probe and wedge arrangement for automated scanning
- » Zero degree and shear wave inspection
- » Digital storage of inspection data
- » Fully auditable inspections
- » Manual data collection option
- » Inspection temperatures from ambient up to 662°F / 350°C

Applications

Pressure vessels and pressure systems are required to undergo periodic statutory inspection to ensure continued safe and reliable operation. Traditionally this has been achieved by means of an internal visual inspection (IVI); however, there can be a very high cost associated with shutting down a vessel (loss of production) and isolating and preparing the item for entry. Assets inspected include:

- » Pressure vessels and systems
- » Pipework
- » Reactors
- » Storage Tanks

Considerations

- » 110V - 240V power required
- » Material to be inspected must be penetrable by ultrasonic sound waves
- » The outer surface of the asset being inspected should be clean and free from loose impediments such as insulation or other debris. Debris could cause the ultrasonic signal to scatter and prevent it from reaching the inner surface. In this scenario, a back-wall echo may not be strong enough to allow credible data to be recorded.
- » High-temperature ultrasonic corrosion mapping at elevated surface temperatures, in some circumstances, can cause a reduction in signal noise to ratio (SNR) which can have a direct effect on the quality of ultrasonic data obtained.
- » Not suitable for non-ferrous material