

Boiler Tube Inspection System

TEMATE TG-IS(B)

Equipment Highlights

- Non-contact EMAT technique.
- Permits 100% inspection of boilers instead of spot checking at up to 15cm/s of scanning speed.
- Ultrasonic EMAT technique provides accurate thickness readings with minimum surface preparation.
- Only system capable of measuring remaining wall thickness on heavily corroded tubes.
- Capable of detecting Hydrogen Corrosion Cracking (HCC), pitting, and caustic gouging.
- Works on carbon steel and clad materials.
- Sensor with integrated encoder and light indicators for fast visual alert to the operator.
- Exclusive boiler mapping software application permits easy visualization of boiler walls with results of inspection for fast analysis and interpretation.

The TEMATE TG-IS(B) is a portable system designed to measure wall loss and detect Hydrogen Corrosion Cracking (HCC), Stress Corrosion Cracking (SCC), caustic gouging, and similar types of defects in boiler tubes.

The system uses high-power Electro Magnetic Acoustic Transducer (EMAT) technology to perform high-speed scans of 100% of the tube wall. The inspection requires minimum surface preparation and it is effective on tubes with surface and internal corrosion and pitting.

The proprietary pitch-catch EMAT design can accurately measure the remaining wall on tubes from 2.5mm to 25mm thick, even when the walls are non-parallel or heavily pitted. A pulsed electromagnet is used to maximize signal-to-noise and provide valid readings on any type of boiler tube. The sensor incorporates a bi-directional encoder, and integrated warning lights for low amplitude or excessive scanning speed.

The TEMATE TG-IS(B) runs with Innerspec's TEMATE POWERBOX 1 instrument, a premium ultrasonic system designed for techniques that require high-speed and high-power such as EMAT, dry-coupled piezoelectric, and air-coupled ultrasound. With 10kW of power and over 1200Vpp, the TEMATE POWERBOX 1 can excite a full range of ultrasonic modes for flaw inspection, thickness, and material property measurements in factory or field environments. A built-in magnet-pulser provides the ability to use electromagnetic probes used for scanning ferromagnetic materials without adhering to the surface, and generating unique wave modes. The instrument includes an intelligent processor with integrated digitizers and broadband receivers. Operation and data management is performed using an external laptop that includes the TEMATE TG-IS(B) software for scanning and reporting results.

The TG-IS(B) is proven technology with hundreds of boilers and thousands of kilometers of inspected tube worldwide.



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TEMATE TG-IS(B)

Components	<ul style="list-style-type: none"> • TEMATE POWERBOX 1 • TEMATE TG-IS(B) Sensor • Laptop with TEMATE TG-IS (B) Software • 23m (75') or 45m (150') cable options
Material Inspected	<ul style="list-style-type: none"> • Carbon steel boiler tubes (regular and clad with stainless steel) • Minimum thickness: 2.5mm (0.100") • Minimum diameter: 50mm (2")
Inspection Technique	<ul style="list-style-type: none"> • Electro Magnetic Acoustic Transducer • Wall Thickness: Pitch-Catch EMAT Coil measuring Time-Of-Flight • Flaw Detection: Amplitude Monitoring • Max. Scanning Speed: 150mm/s with 3mm resolution
Sensor Assembly	<ul style="list-style-type: none"> • Pulsed Electromagnet and permanent magnet options • Integrated encoder and warning lights for lack of amplitude and over speed
Software	<ul style="list-style-type: none"> • TEMATE TG-IS (B) custom designed for Boiler Tube Inspection • Microsoft Windows OS • Setup, scan and playback modules with ability to store and recall setups • Scan module with easy entry of specific codes, descriptions and obstructions that block scanning • Position and time-based triggering. • Data export capabilities • Standalone Report Module for Windows OS to display native data from TEMATE TG-IS(B) in C-Scan, terrain or contour plots. • Ability to combine information from multiple instruments in one map
Data Acquisition	<ul style="list-style-type: none"> • TEMATE POWERBOX 1 System with 1 Channel RF and 1 Magnet Pulser • RF: 10kW of power and up to 1200Vpp with 1% duty cycle • Magnet Pulser: 9kW Peak Power with 1% duty cycle • Bandwidth: 50kHz to 7MHz • Digitizer: 14 bit • Inputs/Outputs: 12 programmable TTL • Electric Power Input: 100-240VAC, 47-63Hz • Dimensions: 324mm x 336mm x 235mm (12.75"x13.25"x9.25") • Weight: 10Kgs (22lbs)
Operating Temperature	<ul style="list-style-type: none"> • 0°C – 40°C (32°F - 105°F)

TEMATE TG-IS(B) Hardware



Scan Mode:

Real time A-Scan, Amplitude and Thickness Strip Charts of the desired measurements.



Report Mode:

Example map of boiler wall with thickness and defect map.

