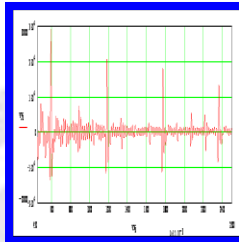


Sonemat

Ultrasonic NDT Solutions



Thickness gauging



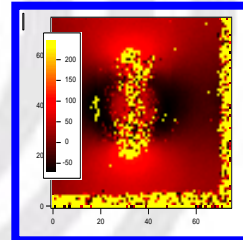
Data acquisition
and processing



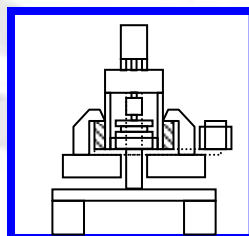
EMAT systems



Crystallographic
texture measurement



Custom B and
C scan systems



Bespoke system
design and
manufacture

Sonemat

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About Us

Sonemat delivers novel non-destructive testing solutions to industry. We have specialist and unique expertise in non-contact ultrasonics, particularly ElectroMagnetic Acoustic Transducers – EMATs.

Non-contact Ultrasonic Technology

We use a number of different approaches to detect and generate ultrasound in samples using various techniques such as:-

Electromagnetic acoustic transduction (EMATs)

Laser based ultrasound

Air coupled ultrasound

The advantages of using such methods are

- No need for acoustic couplants – liquid or dry.
- Tolerant of levels of surface corrosion, dirt and roughness that would cause a problem for conventional inspection.
- Highly efficient on boiler tube type surface oxides.
- The sample or transducer can be moving at high speed.
- EMATs can operate at high temperatures.
- Tolerant of misalignment, particularly on curved surfaces such as tubes.

Consultancy Services

We also offer a consultancy service where we have access to state of the art research facilities. We undertake consultancy work that ranges from proof of concept to provision of an industrially rugged turn-key system.

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EMAT probes

We provide a range of EMAT probes that can be supplied either off the shelf or can be built to customer requirements.

Our standard model is the send-receive shear wave EMAT, for which typical applications include :-

- tube wall thickness measurement
- plate or sheet thickness measurement
- flaw detection

We also provide a range of specialist EMAT designs for generation and detection of compression waves, Rayleigh waves and Lamb waves and for measurement applications at high temperatures.

We also design hybrid systems that employ laser generated ultrasonic sources for applications such as weld inspection or high temperature Rayleigh wave inspection.



Sonemat HWS2225-GC and HWS2235 shear wave EMATs with integral standoff collars, suitable for boiler tube and tank inspection.



The Sonemat HWS2235-WCT EMAT is able to operate on samples at temperatures of up to 800c with active water cooling.

NOTE: We recommend that EMATs are used with a specialised preamplifier and a suitable driver. In some situations such as thickness gauging of boiler tubes with a very favourable oxide coating EMATs can be used with a flaw detector. Without a suitable preamplifier the EMAT will only work on a much more limited range of samples and EMAT performance will not be optimised.

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GS 2020 EMAT Adapter

The EMAT Adaptor **GS2020** provides a means for NDT inspectors to benefit from the advantages of non-contact EMAT transducers for pulse-echo flaw detection and thickness gauging, without the large capital outlay of replacing existing piezoelectric based flaw inspection systems and thickness/corrosion monitors.



- Acts as a **bridge** between an EMAT probe and a flaw detector designed for piezoelectric transducers.
- Incorporates **low power averaging** electronics such that the signal-to-noise performance of the EMAT measurement is dramatically improved.
- Features **automatic gain control (AGC)**, which increases reliability and inspection speed and can eliminate the need for operators to keep adjusting an EMAT stand-off ring or the gain setting on the flaw detector.

Designed to work with modern NDT inspection systems, the Adaptor©, when used with a suitable EMAT (provided as part of the package), has sufficient signal strength and resolving power to work on both oxide coated and oxide free ferritic steel surfaces, providing a major advantage for plant inspection over alternative systems. In certain circumstances measurement of austenitic stainless steel is also possible. The adaptor can also be used with piezoelectric transducers for some situations where the signal-to-noise ratio is too poor to allow measurement, but averaging is able to reveal the ultrasonic signals.

Specifications:

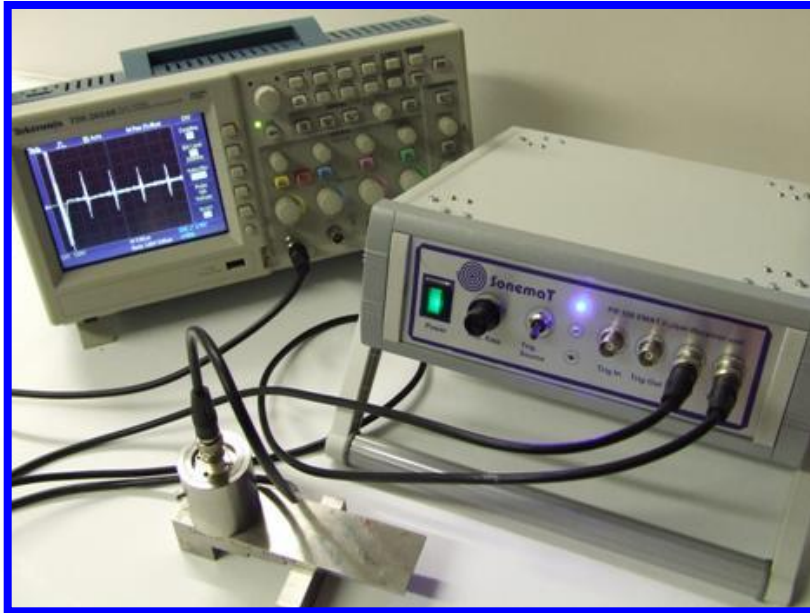
- **Dimensions:** 191 x 137 x 37mm approx. (box)
- **Weight:** 1kg (inc. battery)
- **Storage temperature:** -10 °C - +60 °C
- **Operating temperature:** 0 °C - +40 °C
- **Operating humidity:** 0 - 90%
- **Maximum Input voltage:** 1000V, 100ns pulse width @ 1kHz
- **Maximum Output voltage:** +/- 500mV • **Bandwidth:** 500kHz - 10MHz
- **Power:** 4x AA Batteries (Typically 12hrs battery life)
- **Connections:** 3x LEMO 00 coaxial
- **Compatibility:** Almost all standard flaw detectors — call for more information or a free trial with your flaw detector.

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PR Pulser-Receiver Series

The PR series provide both a pulser unit to drive an EMAT and a built in pre-amplifier to give the necessary wideband low noise amplification required. They can be supplied together with EMATs for customers with their own data acquisition systems or they can be supplied as a complete system with data acquisition controlled by a laptop.



Standard PR pulse echo box with BNC connectors.

Custom housings (e.g. rack mounting) and connectors are available on demand.

Specifications:

Dimensions: 300mm x 200mm x 150mm standard size – can be supplied in smaller box or in a customer specified housing.

Power: 110V or 240V AC at <1A

Connections: BNC standard

Signal Output: +/-3V maximum

Probe output: ~600V p-p depending on probe

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PRP Piezoelectric Pulser-Receiver Series

Designed and built in response to customer demand, the PRP series is a low cost entry level pulse-echo system designed for use with a wide variety of piezoelectric transducers operating in a broadband mode for probes designed to operate between 500kHz to 10MHz. It is supplied as mains powered as standard, but a battery operated version is available at a slightly higher cost if required. This unit is ideal for training or teaching purposes for basic ultrasonic measurements, being easy to set up and use and it is also readily interfaced with either an oscilloscope or another data capture device.



Specifications:

Dimensions: 190mm x 320mm x 130mm standard size – can be supplied in smaller box or in a customer specified housing.

Power: 110V or 240V AC at <1A

Connections: BNC standard

Signal Output: +/-3V maximum

Probe output: ~200V p-p depending on probe

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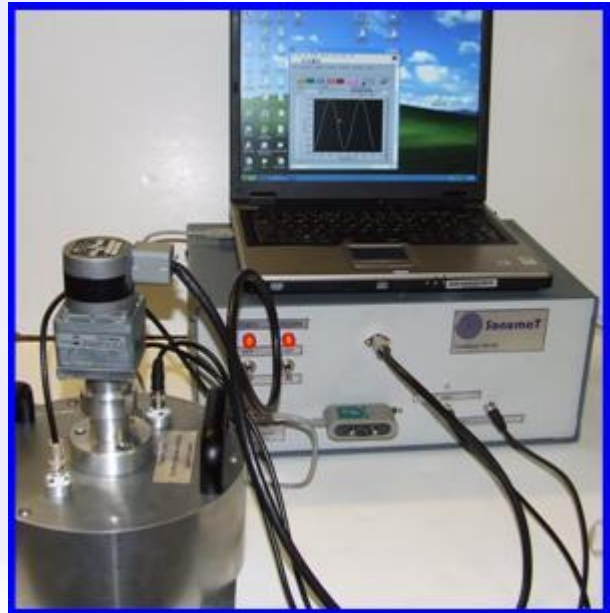
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TE TextEmat Series



TE series scanning head. With integral handles, hard and soft contact modes and weighing less than 6 kg the scanning head can easily be manually positioned on any flat metal surface.

Scanning head with electronics hub and laptop running Sonemat texture scan and analyse software. The laptop allows portability and connectivity to other systems at the users discretion.



Specifications:

Dimensions: 300x300x50mm laptop
240x240x240mm scanning rig
500x500x200mm electronics hub

Power: 110V or 240V AC

Scan Time: 20-300 seconds dependent on resolution

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UltraCouple dry couplant

Designed for use with piezoelectric transducers as a fast and easy to use alternative to coupling fluid, UltraCouple comes in the form of a 2 part elastomer which can be mixed and molded into the exact shape the customer requires. It is highly flexible, providing good surface contact even with uneven surfaces and has a high transmission efficiency, with acoustic properties close to those of water.



The two part elastomer, shown with an example of an oversize UltraCouple disc below a piezoelectric transducer.

Set Product Characteristics

Temperature Range -55 - +200°C

Density 1.05 g/cm³

Hardness A45 Shore

Thermal Conductivity 0.2 W/m•K

Colour Clear

Dielectric Strength 24kV/mm

Acoustic Velocity: 1021 m/s at ~5MHz

Attenuation: 107 m⁻¹ (~1dB/mm) at ~5 MHz

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Laboratory EMAT tools

The Sonemat high power pulser HPP2000 and standalone amplifier SAA1000 are complimentary products designed for the use of relatively low frequency (broadband with most power in the 0-1 MHz range) high power EMATs for applications such as guided waves pitch-catch NDT. Featuring variable amplifier gain and pulse repetition rate, these recently remodeled units have been used in development of a number of novel NDT applications in recent years, including guided wave pipe inspection, railhead crack detection and beverage can wall thickness gauging.



The Sonemat HPP 2000 generates high power broadband pulses suitable for driving EMATs capable of generating guided waves such as Rayleigh waves, Lamb waves and Shear Horizontal (SH) waves. These types of wavemode can be useful for inspecting difficult-to-access areas of pipes, plates and tank walls.



The Sonemat SAA1000 features 2 channels with variable gain of up to 80dB. Multiple SAA 1000 units can be deployed where arrays of detection EMATs are required.

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RITEC Systems

Sonemat Ltd. Is proud to be the UK agent for Ritec Incorporated. Manufacturers of electronic systems for the operation of ultrasonic nondestructive evaluation (NDE) probes and equipment, Ritec have over 25 years of experience in the field and manufacture equipment used by science and industry on a global level.



The Ritec RAM5000 modular system can be adapted to a wide variety of operations and is fully computer controlled.



The Ritec RPR4000 series of toneburst pulser/ receivers provide a robust and powerful tool for guided and bulk wave NDE in the laboratory and industrial environment

Both these systems come with various options for power output and frequency range, and will support computer interfacing. For a comprehensive list of options as well as other available Ritec products, go to the Ritec website (www.ritecinc.com).



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Bespoke Products

Sonemat has plenty of experience in creating custom solutions to ultrasonic inspection problems. With a network of highly skilled ultrasonic engineers and scientists we are in the position to create the ultrasonic NDT solution **YOU** want.

- On line inspection systems.
- Plant inspection products.
- Laboratory based measurement equipment.
- Specialist EMAT transducers.

Consultancy Services

Sonemat also offer a consultancy service where we have access to state of the art research facilities. We undertake consultancy work that ranges from proof of concept to provision of an industrially rugged turn-key system.

Our team has extensive experience in working with industrial partners and implementation of equipment into industrial environments. We have worked with a range of organisations from major international research and technology organisations and industrial manufacturers through to small enterprises, delivering the equipment and the information that our customers need.

For further information on our services, prices, or about our range of products and services, please contact us using one of the following methods:

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By e-mail : info@Sonemat.com

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