How to measure material thickness using the Elcometer MTG8 Ultrasonic Thickness Gauge

The Elcometer MTG range of ultrasonic material thickness gauges accurately and non-destructively measure the thickness of materials when only one side is accessible – ideal for monitoring corrosion and erosion.

Capable of measuring almost any coated or uncoated material, for a wide range of applications – including steel pipelines and storage tanks, porcelain basins, plastic piping, or rubber linings to name a few – the Elcometer MTG range is made up of four models:

- The entry-level Elcometer MTG2, a pre-calibrated gauge which simply measures the thickness of uncoated steel;
- the Elcometer MTG4 and MTG6, which can measure a wide range of materials even when they're coated;
- and the top-of-the-range Elcometer MTG8, which includes all the features and functionality necessary for measuring the material thickness and sound velocity of virtually any material.

For full details about the specific features of every model in the range, be sure to visit Elcometer.com.

Despite their differences, every model in the Elcometer MTG range has a simple, intuitive menu system in multiple languages, so they are easy-to-use without compromising on features or functionality; dust and waterproof equivalent to IP54, ideal for use in the harshest of environments; and accurate to 1% - making this range of Elcometer NDT gauges versatile and reliable.

With the ability to measure the thickness or sound velocity of most materials - such as metals, plastics, glass, epoxies, and ceramics – the Elcometer MTG range uses a dual element transducer, and a small amount of ultrasonic couplant, to measure the substrate thickness, even when it is coated with up to 2mm of paint; ideal for when you need to measure the thickness of a coated material without damaging the coating.

So, how does it work?

Dual element transducers consist of two independent crystals, separated by an acoustic barrier. The two elements are angled so that when one crystal emits an ultrasonic pulse, the energy path creates a "V" shape, hitting the back-wall of the material, and echoing back towards the other crystal, where it is detected. The gauge then uses the speed of the pulse and the time taken to travel from one crystal to another (from pulse to echo), to calculate the thickness of the material - with the acoustic barrier preventing any sound reaching the receiver directly from emitter, before the pulse has completed its path.

Sometimes the ultrasonic signal can be deflected or weakened by the substrate material or coating, so you won't always get a reading instantly. As a result you may have to move the probe around to obtain a reading, ensuring you have an adequate amount of ultrasonic couplant on the surface wherever you're placing the probe. What's more, the Elcometer MTG range only allows you to save a measurement if the signal strength indicator is in the green - avoiding false or incorrect readings.

The Elcometer MTG thickness gauges are designed to work with Elcometer's range of intelligent transducers, which all have automatic probe recognition - so as soon as the transducer is connected to a gauge, the gauge immediately detects what type of transducer you're working with.

If you already have a range of transducers you wish to use which have Lemo Connectors; they can be connected to the Elcometer MTG gauges using a dual element transducer adaptor – all you have to do is tell the gauge what transducer you are using.

The Elcometer MTG gauges have user selectable measurement rates of up to 16 readings per second (16 Hertz); ideal for quickly scrubbing across a surface, recording multiple measurements.

If you are measuring large surface areas, the Elcometer MT6 and MTG8 have scan mode, where you can scrub the transducer over the test area, and the gauges will display the average, lowest, and highest thicknesses across the scanned area.

In addition to displaying the material thickness, the Elcometer MTG6 and MTG8 ultrasonic gauges have a choice of displays, ensuring the information you need is on screen, when you need it.

Using the Elcometer MTG8's differential mode, which displays the last reading, and how much it differs from the user definable nominal value – also known as the target thickness – you get an instant indication of where the material is thicker or thinner than expected.

The Elcometer MTG8 also has B-Scan, which shows any changes in the material thickness, visually, as you move across the surface - ideal for quickly identifying large changes in depth within the material.

What's more, the Elcometer MTG8's ability to set high and low limits, means that whenever a reading exceeds the range, the gauge gives you an audio and visual warning, clearly highlighting any problem areas, instantly.

The Elcometer MTG range have several calibration options; with simple, on-screen instructions that guide you through each method - so it's easy to maintain the gauge's accuracy, at all times. To find out more about all of the calibration methods, make sure you watch our Ultrasonic NDT calibration videos.

The Elcometer MTG8 also allows you to programme up to 3 calibration memories, so you can select a saved calibration method without the need to re-calibrate the gauge.

Storing 100,000 readings in up to 1,000 sequential or grid batches, the Elcometer MTG8 is extremely powerful. The readings can be transferred to your PC - via USB or Bluetooth - for digital reporting using your own inspection app, or our free, easy to use software application - ElcoMaster. Alternatively, transfer live readings directly into your Android or Apple mobile device, and the ElcoMaster App adds a GPS coordinate to each reading, letting you map the location of every measurement.

For more information on Elcometer's full range of NDT inspection gauges, simply visit Elcometer.com, or click on one of the links on-screen.

And please, don't forget to subscribe to the Elcometer Channel to be notified of any new videos.