

How to Calibrate the Elcometer 500 Coating Thickness Gauge

The Elcometer 500 Coating Thickness Gauge accurately, repeatably, reliably and non-destructively measures the dry film thickness of a coating up to 9mm (355mils) thick, which has been applied to concrete or other similar substrates – such as plasterboard, drywall and brick.

The Elcometer 500 can be used straight out of the box. Simply insert the batteries. Connect the probe. Switch on. Select the coating from the calibration library, and take a reading. It is that easy.

Incorporating state of the art ultrasonic measurement technology, each gauge can be calibrated in one of three ways - to a known thickness of the coating to be inspected; by setting the speed of sound of the coating; or by selecting the coating from a list of generic, or user defined coating materials.

Once the gauge has been calibrated, the Elcometer 500 has a measurement accuracy of $\pm 2\%$.

But, how do you go about creating a known thickness of the coating? And how do you find out what its speed of sound actually is?

If the coating manufacturer has included the speed of sound on the product datasheet, then simply select the 'Velocity Entry Calibration Method' from the calibration menu, and insert the speed of sound. The gauge will then ask if you wish to save the coating in the material library for use at a later date. If you do, press 'Yes' and follow the on-screen instructions. By pressing 'No' the gauge is calibrated and returns to the reading screen.

If the speed of sound is not included on the coating manufacturer's datasheet, or is not already listed on your gauge's Coating Material list, then you can create your own calibration standard using the Elcometer Coating Calibration Mould - or CCM.

The Elcometer CCM consists of a steel mould which has a sample and overflow chamber, together with a clear plastic scraper.

Simply place the Elcometer CCM onto a flat horizontal surface, and completely fill the sample chamber with the test coating, making sure that there is a slight dome or meniscus.

Slide the plastic scraper over the coating, allowing the excess to fall into the overflow chamber, and wait until the coating is fully cured, making sure that the CCM remains flat at all times.

If you are not preparing the sample in a laboratory, the best time to prepare a calibration sample is most likely to be when the coating is being applied, as you can take a sample of the material.

Once the coating is fully cured, take a ferrous coating thickness gauge, which has been calibrated using a foil (or shim) on the Elcometer CCM. Then measure and record the dry film thickness at the centre of the coating in the sample chamber.

Select the 1 Point Calibration method from the Elcometer 500's calibration menu, take a measurement of the coating at the same central point as the coating thickness gauge, and enter the dry film thickness value when prompted. Then press 'Set'.

Again, the gauge will ask if you wish to add this to the Coating Material Library. To do so, press 'Yes' and insert an appropriate name for the coating. The material name and speed of sound (or velocity) is now saved for use at any time.

By using the Elcometer CCM in this way the Elcometer 500 calibration is traceable to national and international standards. The user defined coatings can be transferred into the Material Coatings Library within ElcoMaster® for use, at any time, on any Elcometer 500 gauge. Select the coatings from your list and transfer them to any Elcometer 500 gauge.

If you don't have access to the coating to create a calibration sample, and it is not on the product datasheet, the Elcometer 500 has a number of typical materials listed within the generic coating list - including Epoxy, PVC, and Rubber for example.

To verify the calibration and performance of the Elcometer 500, each probe is supplied with two calibration foils (or shims). Select the test foil from the generic material list and measure each foil, comparing the gauge reading to the foil thickness value. The gauge reading should be within $\pm 2\%$ of the foil thickness value.

As the Elcometer 500 uses ultrasonic technology to non-destructively measure the coating thickness on concrete and other similar substrates, the gauge's overall measurement range is determined by the coating's formulation.

Whilst the Elcometer 500 can measure up to 9mm (355mils) of a typical epoxy coating, more sound absorbent coatings such as rubber will reduce the measurement range of the gauge.

Similarly, due to the nature of the measurement technology, coatings with high levels of 'aggregate' may also affect the performance of the gauge.

For more information on the Elcometer 500, the Elcometer CCM, or any other Elcometer product, click on one of the links on-screen, or visit elcometer.com; and please don't forget to subscribe to the Elcometer Channel to be notified of any new videos.