

Using the Elcometer 456 Zero Offset Calibration in accordance with ISO 19840 on Ferrous Substrates

When using the Elcometer 456 Dry Film Thickness Gauge to measure the thickness of a coating on rough, blast coated surfaces; if you have access to a sample of the uncoated substrate you will be measuring, then you should undertake a rough surface (or 2-point) calibration.

However, if you don't have access to the uncoated substrate, then you can use the Elcometer 456's patented Zero Offset calibration method, which helps measure film thicknesses in accordance with ISO 19840.

ISO 19840 simply states that if a blast profile is unknown, you should calibrate on smooth steel and then subtract a predefined correction value from the measurement taken on the coated surface.

The Elcometer 456's patented zero offset calibration automatically subtracts this correction value from the measurement, so you don't have to.

To undertake a Zero Offset calibration in accordance with ISO 19840, you will need:

- An Elcometer 456 DFT gauge, and a probe (if using a separate gauge).
- An uncoated, smooth, steel test plate, such as a ferrous Elcometer zero plate.
- And an undamaged, clean calibration foil or shim, which is slightly thicker than your expected coating thickness value. If you are not sure of the thickness, or wish to calibrate across the full range of the probe, then select a foil, or set of foils that, when combined, will achieve the probe's full scale range. You can stack foils to increase the thickness value if you need to. Just be sure to stack at 90 degrees so the label doesn't affect the combined foil thickness.

The Elcometer 456 is an intelligent gauge, so, once the gauge has been set to the Zero Offset Method, it will guide you through the calibration process, one step at a time.

To set up Zero Offset Calibration, press the "Cal" softkey. Highlight "Cal Method" using the up and down soft keys, and press the "Select" softkey. Then highlight and select "Zero Offset". Now enter the predefined offset into the gauge using the up and down softkeys. Once done press OK, followed by the Back softkey. The Zero Offset Calibration icon will now be displayed next to the "Cal Method" menu item.

To calibrate the Elcometer 456, simply select the "calibrate" menu item and follow the on screen prompts.

Please note, when using the Elcometer 456, hold gauge or probe like a pen, and place down evenly, at a 90 degree angle to the surface. When placing the probe on a calibration foil, ensure you take readings from the centre of the foil. When using an integral gauge or a probe with a wider scale range, extra care should be taken to ensure that none of the probe touches the foil label – otherwise you are measuring the thickness of the foil and the foil label!

Calibration Step 1

Put your selected foil flat onto the uncoated test plate (or zero plate). Then place the probe carefully onto the foil.

Take several readings on the foil to average out the individual readings, which increases the accuracy of the calibration - we advise at least three.

If you get a massively different reading, this usually means the probe has been misplaced, and it's best to restart the routine – simply press the “Escape” softkey and start again.

Once you've taken a sufficient number of readings on the calibration foil, adjust the value on the gauge to match the calibration foil's thickness - pressing and holding a key down will change the readings rapidly. Then press “set”.

Calibration Step 2

The Elcometer 456 will now ask you to place the probe onto the uncoated test plate. Again you can take a number of readings, to obtain an average zero, then simply press the “zero” softkey to complete the calibration process.

The Elcometer 456 then gives you the option to test your readings, so you can check the accuracy of your calibration before you start taking readings. If you have undertaken the calibration whilst within a memory batch, this feature ensures that the test readings that you take are not included within your memory and measurement statistics.

To test the calibration of your gauge, simply replace the foil you used for the calibration, or any thickness below that value, take a reading, and compare it to the foil thickness. If the gauge reading matches, or is within the gauge's specified accuracy, press OK.

Typically the Elcometer 456's specified accuracy is 1% at the point of calibration, and 3% across the full range; but check the website or product catalogue for the correct accuracy of the gauge/probe combination.

With the calibration procedure complete, the Elcometer 456 will now automatically subtract the predefined offset value, from all of your readings.

For more information and training on the Elcometer 456 Coating Thickness Gauge, 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.