

Testing for Pinholes with the Wet Sponge Method using the Elcometer 270 Pinhole Detector

When testing for pinholes on thin coatings, powder coatings, and other applications where you do not wish to damage the coating; typically the wet sponge technique, also known as the low voltage pinhole method, is used.

The wet sponge technique is a quick and simple method for testing insulation coatings less than 500 microns (20 mils) thick on conductive substrates. Put simply, a low voltage no bigger than 90 volts is applied to a damp sponge.

When you pass the sponge steadily over the coating, liquid from the sponge is drawn through any pinholes by capillary action; and when it touches the bare substrate, the current flows from the detector, through the substrate, and back to the detector through a signal return lead, which is clipped to an uncoated section of the substrate. This completes a low voltage circuit, setting off an alarm on the detector, letting you know where you have a pinhole.

Supplied with 3 AA batteries that provide up to 200 hours use straight out of the box, the Elcometer 270 Pinhole Detector provides both visual and audible alarms when a flaw is found, and it is incredibly easy to use.

To begin, connect the signal return cable to an uncoated part of the substrate being tested, using the easy release crocodile clip. A 4m signal return cable is provided as standard, but if you're testing on larger structures, a 10m cable is available. Either way, each signal cable is snag proof, so you can always move freely while testing.

Next, wet the sponge. This should be done with clean tap water, as it contains salts that allow it to conduct electricity. It's important that you have an appropriate amount of water on the sponge before testing, as too little water will not conduct electricity and not locate any pinholes; whereas too much water will drip from the sponge and cover the surface under test, which can result in pinholes being detected in the wrong location.

So, to ensure the sponge is suitably wetted; first thoroughly wet the sponge, then squeeze out the excess - so the sponge is damp, but water is not dripping freely from it.

To maximise the efficiency of the Elcometer 270, you can add a surfactant to the water. Using a surfactant will significantly reduce the surface tension of the water, allowing the moisture to penetrate the smallest of pinholes. For how much to add, simply follow the dilution instructions supplied with the surfactant.

With the sponge suitably damp, switch on the Elcometer 270 - keeping the sponge clear of the test surface.

The Elcometer 270 is available in either dual or triple voltage models. The dual voltage model can be set to 9V, for testing thin coatings up to 300 microns (12 mils) thick; and 90V, for coatings up to 500 microns (20mils). The triple voltage model can also test at 67.5V, the US standard test requirement.

Every time the tester is switched on or the voltage is changed, the Elcometer 270 automatically tests the calibration of the internal voltage and sensitivity.

With the calibration tested, you can now pass the sponge over the coated surface to test for pinholes. If the sponge passes over a pinhole, the Elcometer 270 will instantly alarm.

If you need to locate a pinhole more precisely, simply retest the area using just a corner of the sponge.

Simple yet versatile, the Elcometer 270 is supplied with a standard wand and a universal flat sponge to suit most applications. However, there are a wide range of fully interchangeable accessories to suit different needs.

The roller sponge wand is ideal for large, flat surface inspection. And for further flexibility, the separate wand adaptor and belt clip converts the gauge into a separate pinhole detector, providing a lightweight, alternative way to test.

Using the telescopic wand adaptor, which extends up to 1m in length, the Elcometer 270 makes it easy to test floors and high areas. You can even connect further extension pieces, so no area is out of reach.

The Elcometer 270 is available as part of a Pinhole Detector Inspector's Kit; which includes the various wand adaptors, spare sponges, surfactant, and a 10m signal return cable. Simply choose your preferred model of Elcometer 270, and you have everything you need for low voltage flaw detection.

Testing on coatings up to 500 microns (20 mils) thick, the Elcometer 270 is the ideal gauge for detecting pinholes.

This video is part of a series on pinhole and holiday detection. In the next part we'll be showing you how to detect flaws using the high voltage continuous DC method, with the Elcometer 236 and Elcometer 266.

You can click the pop-out in the top right to go to the next video in the series, select one of the icons at the end of the video, or simply visit Elcometer.com if you can't see the links.

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