

How to measure soluble salts on surfaces using the Elcometer 135C Bresle Test Patch

Contamination of steel surfaces from soluble salts - such as chloride, sulphate, or nitrate ions - can lead to premature coating failures. By measuring and monitoring the concentration of soluble salts, we can ensure that the surface is clean enough for a coating to be applied.

Whilst there are many methods which can be used to determine the level of surface cleanliness – such as the Elcometer 130 SSP - the Test Patch, or Bresle Method, has been the most often referred to method for measuring the concentration of soluble salts on steel surfaces - prior to and after blasting, cleaning, and coating - for more than 20 years.

The Bresle Test Patch Method determines the concentration of all soluble salts present on a steel surface, by measuring the level of conductivity of an amount of distilled water, which has been used to wash a predefined area of the steel substrate.

The Elcometer 138C Bresle Salt Kit contains the new Elcometer 135C Bresle Test Patches, and has everything you need to measure the concentration of soluble salts in accordance with ISO 8502.

Wearing a pair of clean gloves to avoid contamination, remove the protective backing and foam centre from a test patch and press the adhesive foam firmly onto the surface, making sure that it makes a seal around the whole frame, and a minimal amount of air is trapped within the central test compartment – the void.

Using a clean syringe containing 3ml of distilled water, insert the needle through the foam perimeter wall into the void within the patch, making sure that the needle passes through the foam and not through the membrane. This can best be achieved by holding the syringe at an angle of about 30 degrees. The new Elcometer 135C Bresle Test Patches have a thicker foam wall, which is designed to make this easier.

To ensure that the whole surface area within the void space is tested, the air in the compartment should be extracted before inserting all 3ml of water. This can be done by first injecting half of the water into the void - then drawing out the trapped air and expelling it from the syringe - before finally injecting the remainder of the water into the test compartment.

Depending on which test method you are using, agitate the liquid within the patch - either by flushing with the syringe or massaging the membrane - making sure no liquid escapes from the puncture hole. The membrane on the new Elcometer 135C test patches is ideal for this, as it is much more pliable, whilst being incredibly strong.

ISO agitation guidelines recommend the solution should stay in the patch for 10 minutes to allow the salts to fully dissolve into the liquid. Within the 10 minutes, use the syringe to draw out as much of the solution as possible, and then reinject it into the patch, so it thoroughly mixes the salts with the liquid. ISO guidelines recommend that this “flush” is done at least four times within the 10 minutes.

Using the same syringe, remove all of the liquid from the void and measure its concentration using a conductivity meter - such as the Elcometer 138 Horiba Conductivity meter.

The recorded conductivity value is then used to calculate the soluble salt concentration across the surface area. If you are using the Elcometer 138 Horiba Conductivity meter, the concentration is displayed on the gauge in micro-Siemens/cm. If you require the density of salts value in mg/m² simply multiply the reading by 1.2.

The test patch should now be removed and the test area should be cleaned prior to coating. Even though the adhesive is incredibly strong, the new Elcometer 135C simply peels off and doesn't leave any of the foam on the surface – so you won't need a scraper.

The new Elcometer 135C Bresle Test Patches, which are supplied with the new Elcometer 138C Bresle Salt Kit, are available with a batch test certificate – certifying the test patches' background cleanliness and test area dimensions prior to shipment. This test certificate is available to download from the Elcometer website.

To ensure that the Elcometer 135C Bresle test patches remain clean, each box of 25 or pack of 100 are sealed prior to shipment.

For more information and training on this test method, the Elcometer 138C and Elcometer 135C, or any other Elcometer products, visit our website.