

Elcometer 138/2

Surface Contamination Kit

Operating Instructions

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A copy of this Instruction Manual is available for download on our Website via www.elcometer.com.

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1 ABOUT THIS TEST KIT

The Elcometer 138/2 Surface Contamination Kit provides materials to collect a sample of contamination from a surface in accordance with ISO 8502-6 (Bresle method).

A solution is produced from the test surface using the Bresle Sampler method and the pH, chloride concentration and iron concentration are then measured using single-use test strips.

To maximise the benefits of this test kit please take some time to read these Operating Instructions. Do not hesitate to contact Elcometer or your Elcometer supplier if you have any questions.

1.1 WHAT THE BOX CONTAINS

- pH Test Strips in plastic container (sufficient for 100 tests)
- Iron Test Strips in metal bottle (sufficient for 100 tests)
- Chloride Test Strips in plastic bottle (sufficient for 40 tests)
- Bresle Samplers in cardboard containers (sufficient for 50 tests)
- Syringes, 5 ml, 3x

- Needles (blunt), 3x
- Beaker, plastic, 30 ml
- Operating instructions
- Carrying Case

1.2 PACKAGING

The Elcometer 138/2 Surface Contamination Kit is packed in a cardboard package. Please ensure that this packaging is disposed of in an environmentally sensitive manner. Consult your local Environmental Authority for further guidance.

1.3 TEST STRIP EXPIRY DATE

All the test strips included in this Kit have a shelf life determined by the manufacturer. Before using a test strip always check that the expiry date has not been exceeded. The expiry date of the test strips is marked on the test strip containers. Replacement test strips are available from Elcometer or your local Elcometer supplier - see “Spares and accessories” on page 10.

1.4 MANUFACTURERS' INSTRUCTIONS

Further information concerning the use of the test strips may be found in the manufacturers' instructions included with the test strip containers.

1.5 CAUTION



The needles supplied for use with this kit are blunt, but care must be exercised when using and disposing of these needles to prevent accidental needle stick injuries. It is recommended that used needles be disposed of as special waste, and not in landfill.

2 TEST PROCEDURE

The test procedure consists of two stages:

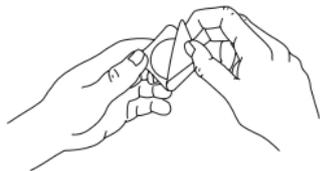
- Stage 1 - produce a solution
- Stage 2 - test the solution for chloride, iron or pH as required

Note: *Wear gloves during testing. The tests are extremely sensitive; wear clean latex or nitrile gloves during the extraction of soluble salts to prevent contamination of the surface or sample.*

Note: *Ensure that all parts which come into contact with the test solution are clean (the beaker, the syringe and the needle). Rinse with deionised water if necessary.*

2.1 PRODUCING A SOLUTION

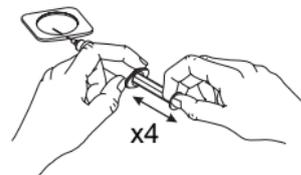
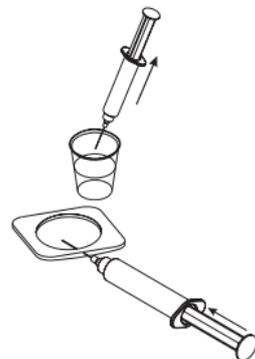
1. Remove protective backing and foam centre from Bresle Sampler.



2. Apply sampler to surface. Press firmly around perimeter of sampler to ensure a complete seal.



3. Pour approximately 3 ml of deionised water^a into the beaker, by eye. Fit a needle into the syringe. Suck 3ml into the syringe. Throw away what is left in the beaker (do NOT put the deionised water back into the bottle!).
4. Insert needle into sampler through spongy foam perimeter and inject 1.5 ml of deionised water into sampler. Do not remove needle.
5. With needle still in sampler, reposition needle and evacuate any air in sampler.
6. Remove needle from sampler, hold syringe with needle pointing upwards and expel air.
7. Insert needle into sampler through spongy foam perimeter and inject remaining deionised water into sampler. Do not remove needle.
8. After a suitable period of time^b suck the solution back into the syringe and then immediately re-inject back into the sampler.
9. Repeat step 8 until at least four injection/sucking cycles have been completed.



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- a. Deionised water is available from Elcometer or your local Elcometer supplier - see "Spares and accessories" on page 10.
 - b. On unpitted blast-cleaned areas a period of 10 minutes has been found satisfactory.

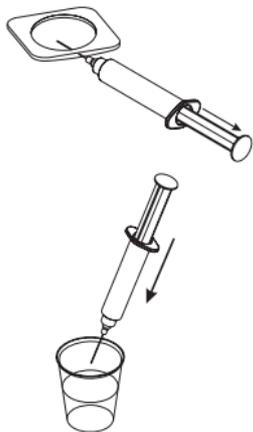
10. At the end of the last cycle extract as much solution as possible and remove needle from sampler^c.

11. Transfer the contents of the syringe into the beaker.

12. Test the solution for Chloride, Iron or pH as required - see sections 2.2, 2.3 and 2.4.

13. After the test is complete:

- Record temperature of the test surface.
- Remove Bresle Sampler from surface and clean surface. If required, any adhesive residue from the Bresle Sampler left on the test surface can be removed by wiping the surface with a cloth moistened with a suitable solvent. Ensure that the solvent will not damage the surface before use.
- Rinse all components of the test kit in fresh water. The components can then be used again.



c. During steps 4 to 10 it is essential that no solution is lost. If any solution is lost the test shall be rejected.

2.2 TESTING FOR CHLORIDE

1. Remove a titrator from the plastic bottle marked 'Chloride' and replace cap on bottle immediately.

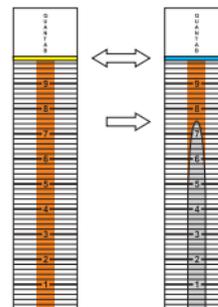
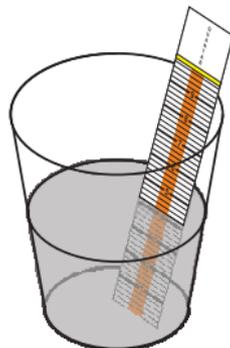
2. Insert lower end of titrator into solution. Do not allow solution to reach yellow band at top of titrator.

Fluid will rise up the wick inside the titrator by capillary action.

3. Allow the solution to saturate completely the titrator wick; complete saturation is indicated by the yellow band at the top of the titrator changing to a dark blue colour.

4. Note the position on the numbered scale of the tip of the white column which has become visible; this represents the Quantab unit value.

5. Refer to the table on the bottle to convert the Quantab unit value to chloride concentration, (mg/L or ppm).

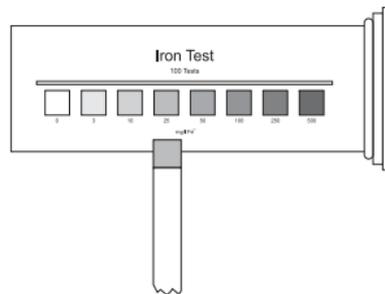
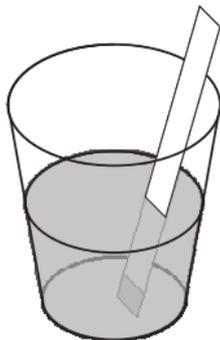


Note: The solution contains salt in a 3ml sample taken from a 12.5cm² area. Estimated salt/area as Sodium Chloride (according to ISO 8502-5)

- $\mu\text{g}/\text{cm}^2$ = 0.4 x concentration in ppm
- mg/m^2 = 4.0 x concentration in ppm

2.3 TESTING FOR IRON

1. Remove a test strip from the metal bottle marked 'Iron Test' and replace cap on bottle immediately.
2. Insert lower end of test strip into solution (pH 1 to 7, 15°C to 25°C) for 1 second.
3. Remove test strip from the solution and shake off excess liquid from the strip.
4. Wait 10 seconds.
5. Compare the test strip with the scale on the metal bottle. Determine which of the scale colours coincides most exactly with that of the test strip.
6. Read off the corresponding result in mg/l Fe^{2+} or, if necessary, estimate an intermediate value.



For determination of Fe^{3+} and should any other colour changes occur, refer to the manufacturers' instructions included with the test strip container.

Note: The colour of the reaction zone on the test strip may continue to change after the specified reaction time (10 s) has elapsed. This must not be considered as a measurement.

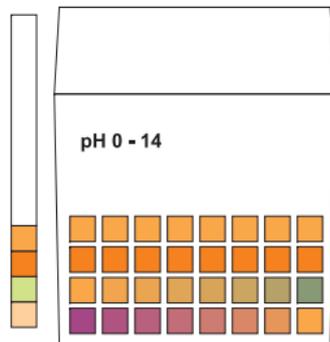
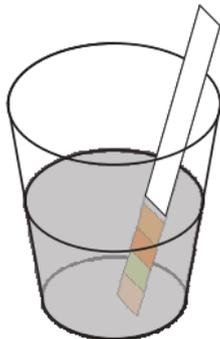
Note: If the colour of the reaction zone is equal to or more intense than the darkest colour on the scale, repeat the measurement using fresh samples diluted with deionised water until a value of less than 500 mg/l Fe^{2+} is obtained. This must then be multiplied by the corresponding dilution factor.

Note: The reading will be the concentration of iron in 3ml water. To compare this reading with that of another collection method, scale the volume of water.

Note: The sample is taken from an area of 12.5cm². To compare with another collection method, scale the area.

2.4 TESTING FOR pH

1. Remove a test strip from the plastic container marked 'pH 0 - 14' and replace lid on container immediately.
2. Insert coloured end of test strip into solution to a depth sufficient to cover all coloured squares.
3. Remove test strip from the solution and shake off excess liquid from the strip.
4. Holding the test strip as shown, compare the test strip with the coloured scale on the paper insert inside the plastic container. Determine which of the scale colour groups coincides most with that of the test strip.
5. Read off the corresponding pH value (0 to 14).



Note: For weak solutions, leave the test strip immersed in the solution for a period of up to 10 minutes until there is no further colour change, then proceed to step 3 above.

3 STORAGE

Always store the components of the Elcometer 138/2 Surface Contamination Kit in the carrying case when the kit is not being used.

4 TECHNICAL SPECIFICATION

Bresle sampler size:	5.2 x 5.2 cm
Bresle test area:	12.5 cm ²
Bresle sample volume:	2.6 ± 0.6 ml
Measuring range of test strips, pH:	0 to 14 pH
Iron:	3 - 10 - 25 - 50 - 100 - 250 - 500 mg/l Fe ²⁺ in 3ml water from 12.5 cm ² area
Chloride:	30 to 600 ppm Cl ⁻ (0.005 - 0.1% NaCl) (12-240 µg/cm ² of ISO salt mix)

5 SPARES AND ACCESSORIES

The following items are available from Elcometer, or your local supplier.

Bresle Samplers, box of 50:	E135----A
Bresle Patches, box of 25	E135----B
Syringes, 5 ml, 3x:	T13818517
Needles, 3x:	T13818518
Beaker, plastic, 30 ml:	T13818519
Deionised water, 250 ml:	T99911344
pH Test Strips (sufficient for 100 tests):	T13820562

Iron Test Strips (sufficient for 100 tests): T13820563

Chloride Test Strips (sufficient for 40 tests): T13820564

6 RELATED EQUIPMENT

In addition to the Elcometer 138/2 Surface Contamination Kit, Elcometer produces a wide range of other equipment for testing and measuring the characteristics of coatings. Users of this test kit may also benefit from the following Elcometer products:

- Elcometer 134A Chloride Ion Test Kit for Abrasives
- Elcometer 134S Salt Detection Kit for Blast Cleaned Surfaces
- Elcometer 134W Chloride Ion Test Kit for Water/Liquids
- Elcometer 130 Salt Contamination Meter
- Elcometer 138 Bresle Kit and Patches (chloride measurement using a Conductivity Meter)

For further information contact Elcometer, your local supplier or visit www.elcometer.com