

138/2 Surface Contamination Kit

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**User Guide**  
**Elcometer 138/2**  
**Surface Contamination Kit**

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For the avoidance of doubt, please refer to the original English language version.

Kit Dimensions: 346 x 292 x 84mm (13.6 x 11.5 x 3.3")

Kit Weight: 2.1kg (4lb 7oz)

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## 1 OVERVIEW

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).

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

## 2 BOX CONTENTS

- Elcometer 135C Bresle Test Patch; x50
- pH Test Strips; x100
- Iron Test Strips; x100
- Chloride Test Strips; x40
- Syringes, 5ml (0.17 fl oz); x3
- Needles (Blunt); x3
- Plastic Beaker; 30ml (1 fl oz)
- Transit Case
- User Guide

## 3 TEST PROCEDURE

The test procedure consists of two stages:

Stage 1: Produce a solution

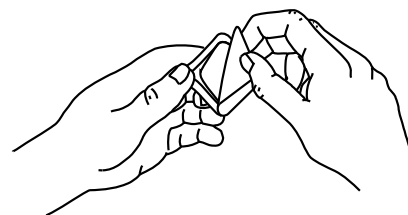
Stage 2: Test the solution for chloride, iron or pH as required

### 3.1 BEFORE YOU START

- 1 As the test is extremely sensitive, clean latex or nitrile gloves should be worn during the extraction of soluble salts to prevent contamination of the surface or sample.
- 2 Ensure that all parts which come into contact with the test solution are clean; the beaker, the syringe and the needle. Rinse with pure water if necessary.

### 3.2 PRODUCING A SOLUTION

- 1 Remove the printed protective backing and foam centre from the Bresle patch.



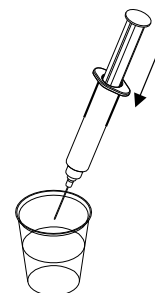
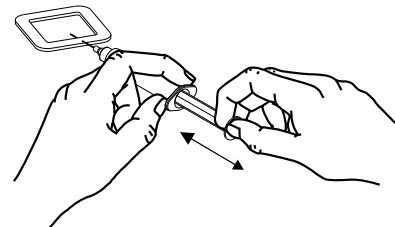
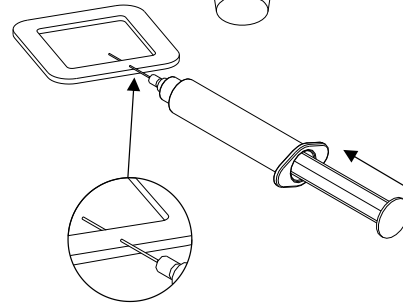
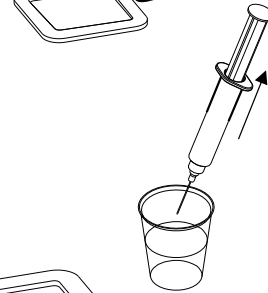
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**3 TEST PROCEDURE (continued)**

- en 2 Apply the patch to the surface pressing firmly around the perimeter of the patch to ensure a complete seal. Remove the protective paper cover.
- 3 Pour approximately 3ml of pure water<sup>a</sup> into the beaker, by eye. Fit a needle into the syringe and suck 3ml into the syringe. Throw away the remaining water in the beaker, do not put the pure water back into the bottle.
- 4 Insert the syringe into the patch through the spongy foam perimeter at an angle of approximately 30° to the test surface so that it passes through the foam into the compartment formed by the elastomer film and the test surface. If the patch is positioned in a difficult position bend the needle as required.
- 5 Inject the pure water into the patch. Do not remove the needle.
  - ▶ If necessary, any air can be evacuated into the syringe and allowed to stay above the water in the syringe. Take care not to re-insert the air during steps 6 and 7.
- 6 During a suitable period of time<sup>b</sup>, without removing the needle, suck and re-inject the solution at least four times<sup>c</sup>.
- 7 At the end of the period, extract as much solution as possible and remove the syringe from the patch<sup>c</sup>.
- 8 Transfer the contents of the syringe into the beaker.
- 9 Test the solution for chloride, iron or pH as required - see Sections 3.4, 3.5 and 3.6.



<sup>a</sup> Pure water is available from Elcometer or your local Elcometer supplier, see Section 5 'Spares & Accessories on page 7.

<sup>b</sup> On un-pitted blast-cleaned areas, a period of 10 minutes has been found to be satisfactory, though this time should be agreed by the interested parties.

<sup>c</sup> During steps 6 and 7, it is essential that no solution is lost. If any solution is lost, the test shall be rejected.

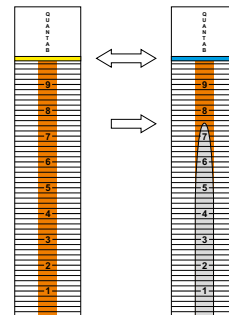
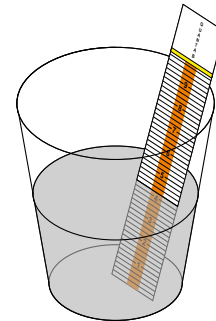
### 3 TEST PROCEDURE (continued)

#### 3.3 AFTER TEST

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

#### 3.4 TESTING FOR CHLORIDE

- 1 Remove a titrator from the plastic bottle marked 'Chloride' and replace the cap on the bottle immediately.
  - ▶ The test strips included in the 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 is marked on the test strip container. Further information concerning the use of test strips can be found in the manufacturers' instructions included in the test strip container.
- 2 Insert the lower end of the titrator into the solution. Do not allow the solution to reach the yellow band at the top of the titrator. Fluid will rise up the wick inside the titrator by capillary action.
- 3 Allow the solution to completely saturate 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 12.5cm<sup>2</sup> area.  
Estimated salt / area as Sodium Chloride (according to ISO 8502-5):*

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

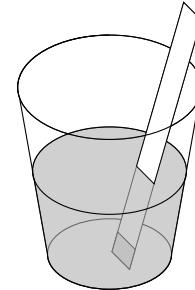
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### 3 TEST PROCEDURE (continued)

#### en 3.5 TESTING FOR IRON

1 Remove a test strip from the metal bottle marked 'Iron Test' and replace the cap on the bottle immediately.

- ▶ The test strips included in the 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 is marked on the test strip container. Further information concerning the use of test strips can be found in the manufacturers' instructions included in the test strip container.



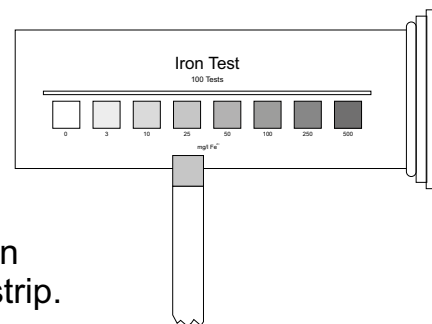
2 Insert the lower end of the test strip into the solution (pH 1 to 7, 15°C to 25°C) for 1 second.

3 Remove the 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<sup>2+</sup> or, if necessary, estimate an intermediate value.



For determination of Fe<sup>3+</sup> 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.*

*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 pure water until a value of less than 500mg/l Fe<sup>2+</sup> is obtained. This must then be multiplied by the corresponding dilution factor.*

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

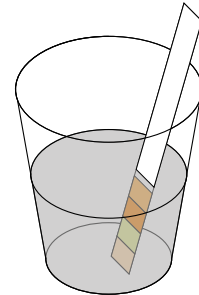
*The sample is taken from an area of 12.5cm<sup>2</sup>. To compare with another collection method, scale the area.*

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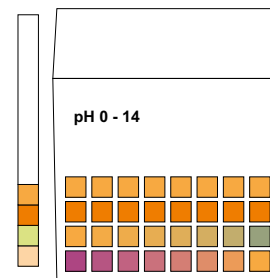
### 3 TEST PROCEDURE (continued)

#### 3.6 TESTING FOR pH

- 1 Remove a test strip from the plastic container marked 'pH 0 - 14' and replace the lid on the container immediately.
  - ▶ The test strips included in the 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 is marked on the test strip container. Further information concerning the use of test strips can be found in the manufacturers' instructions included in the test strip container.
- 2 Insert the coloured end of the test strip into the solution to a depth sufficient to cover all coloured squares.
- 3 Remove the test strip from the solution and shake off excess liquid.
- 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 of the corresponding pH value (0 to 14).



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

### 4 TECHNICAL SPECIFICATION

4.1 BRESLE PATCH	
Patch Size	5cm x 5cm
Test Area	12.5cm <sup>2</sup>
Sample Volume	3ml
4.2 TEST STRIPS - MEASURING RANGE	
Chloride	30 to 600ppm Cl <sup>-</sup> (0.005 - 0.1% NaCl) (12 - 240µg/cm <sup>2</sup> of ISO Salt Mix)
Iron	3 - 10 - 25 - 50 - 100 - 250 - 500mg/l Fe <sup>2+</sup> in 3ml of water from 12.5cm <sup>2</sup> area
pH	0 to 14 pH

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## 5 SPARES & ACCESSORIES

**en** The Elcometer 138/2 Surface Contamination Kit is complete with all the items required to get started and take measurements however, over the life of the kit, replacements may be required. The following items are available from Elcometer or your local Elcometer supplier.

Description	Part Number
Elcometer 135C Bresle Test Patch, Pack of 25	E135----C25
Elcometer 135C Bresle Test Patch, Pack of 100	E135----C100
Elcometer 135B Bresle Patch, Pack of 25	E135----B
Chloride Test Strips, Pack of 40	T13820564
Iron Test Strips, Pack of 100	T13820563
pH Test Strips, Pack of 100	T13820562
Bottle of Pure Water; 250ml (8.5 fl oz)	T13827259
Syringes, 5ml (0.17 fl oz); x3	T13818517
Needles (Blunt); x3	T13818518
Plastic Beaker; 30ml (1 fl oz)	T13818519

## 6 LEGAL NOTICES & REGULATORY INFORMATION

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All other trademarks acknowledged.

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.

### 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.



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