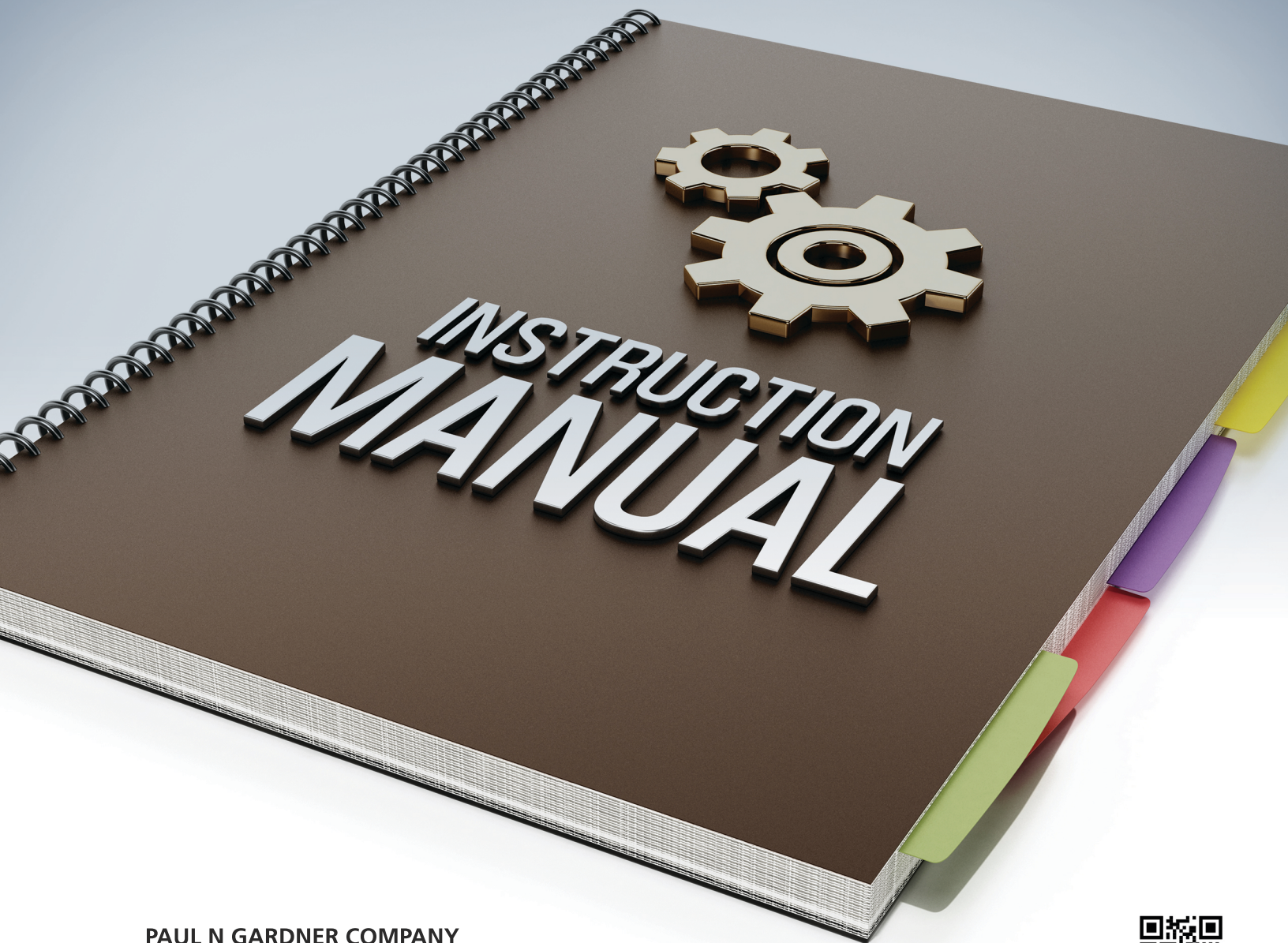




PAUL N GARDNER COMPANY
9104 GUILFORD ROAD, SUITE H
COLUMBIA, MD 21046 USA

EMAIL GARDCO@ALTANA.COM
PHONE +1-954-946-9454



INSTRUCTIONS

GARDCO DISTRIBUTED PRODUCTS



BRESLE SALT CONTAMINATION KIT



**Instruction for assessment of soluble salts
on steel surfaces according to:**

ISO/DIS 8502-9 “Field method for soluble salts by conductometric measurement”
ISO 8502-6 “Extraction of soluble contaminants for analysis - The Bresle method”

INSTRUCTIONS FOR USE

1. Select the region on the steel surface to be used as the test area for assessment of the total surface density of salts. It should preferably be dry and with no loosely adherent rust, dirt or moisture (dampness), so that the patch frame can properly attach to the surface. Take a patch from the pack and remove the outer protective paper and the square of punch-out material with its inner protective paper. Press the adhesive side of the patch against the test surface as shown in Figure 1.

2. Before performing the test, the electrical conductivity of the distilled or deionized water itself must be measured. Remove the 30 ml measuring graduated beaker and measure out 15 ml of the distilled or deionized water. Fill the syringe with water from the measuring graduate; eject the water from the syringe back into the graduate and remove the syringe. Then insert the meter electrode into the graduate and move it gently up and down in the water to wash it. Turn the meter "ON", set the meter to conductivity and insert the electrode into the sample making sure that the electrodes are completely submersed and record the reading. This is the zero reference value (L_{zero}) of the conductivity of the water. (See Figure 2)

If the zero reference value exceeds 5 $\mu\text{S}/\text{cm}$, the equipment has probably become contaminated from previous use. The first thing to do is repeat the entire washing procedure. If this fails to bring the zero reference value down below 5 $\mu\text{S}/\text{cm}$, replace the water in the bottle with cleaner water.

3. Inject the distilled or deionized water into the Bresle patch attached to the steel surface for the purpose of sampling. Do this by sucking about 3 ml of the water from the measuring graduate and then inserting the needle through the frame of the patch so that about half the length of the needle is projecting into the compartment in the patch. Note that the needle must be inserted through the frame on the skew, so that it passes through the adhesive foam body of the patch. (As shown in Figure 3)

Inject the water into the compartment and leave the syringe and needle in position until the entire sampling process has been concluded as described in (4) below.

If the test surface is not quite flat, it is a good idea to bend the needle before inserting it so that it follows the curve of the test surface.

4. Dissolve the salts on the test surface by carefully using the syringe as a pump to pump the water in the syringe and the patch compartment back and forth between them.

This operation should go on for about five minutes, with 2 -4 pumping strokes per minute (Figure 4). When finished, suck up the entire volume of water into the syringe, remove the syringe from the patch and eject the water back into the measuring beaker to join the remaining water there. (Figure 5)

After the final pumping, get the last drops of the liquid into the syringe by pulling the plunger out a few more millimeters to create a negative pressure in the syringe and patch. This will suck almost all the remaining liquid out of the patch compartment.

5. After this sampling procedure remeasure the electrical conductivity of the water now containing the dissolved salts. Insert the electrode into the water in the measuring graduate and slowly stir this solution, moving it up and down a few times so that the solution in the graduate is *thoroughly* mixed. Record the measure value (L_{sample}) of electrical conductivity in $\mu\text{S}/\text{cm}$.

6. Calculate the total surface density of salts on the test surface from the difference between the measured value of electrical conductivity after sampling (L_{sample}) and the zero reference value (L_{zero}) as follows:

The surface density of soluble salts (S) in mg/m^2 on the test surface is given by:

$$S = 6 \times (L_{\text{sample}} - L_{\text{zero}}) \text{ where } L_{\text{sample}} \text{ and } L_{\text{zero}} \text{ are in micro siemens } (\mu\text{S}/\text{cm}).$$

7. The equipment must be cleaned after use. Throw away the contaminated water in the graduated measuring beaker and pour another 15 ml portion of the distilled or deionized water into the measuring graduate. Repeat the washing procedure as in (2) above. After washing, the zero reference value of the water conductivity should not exceed 5 $\mu\text{S}/\text{cm}$.

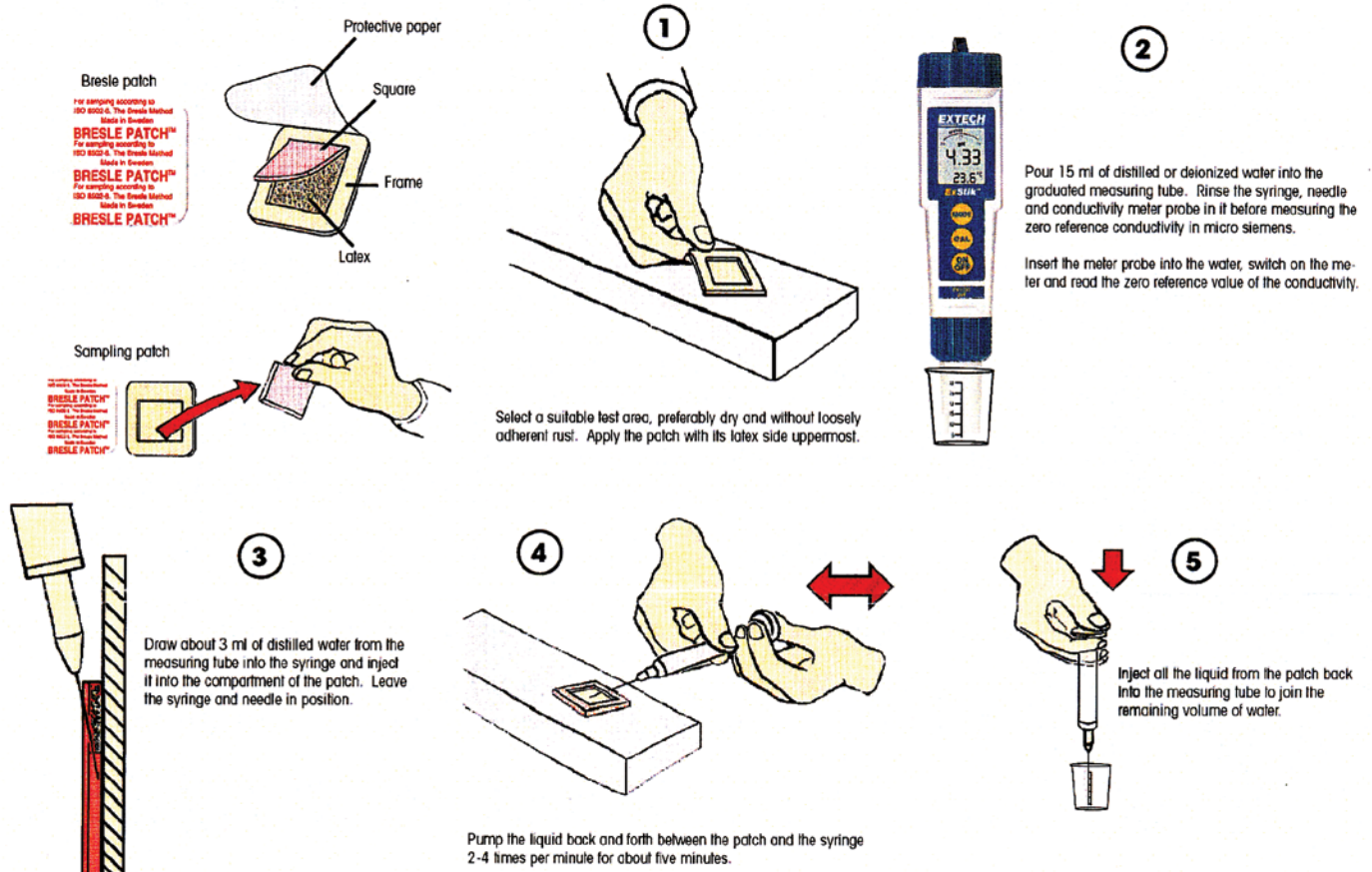
8. The Bresle patch can be removed from the steel surface after sampling in a number of ways:

It can be removed by blasting if the assessment of the surface cleanliness is performed in connection with blasting. Alternatively, it can simply be pulled off and any adhesive residues removed if necessary with a suitable solvent, such as acetone.

Recommended highest surface densities of salts

The maximum permissible surface density of salts on a steel surface prior to surface treatment depends on the type of paint to be applied and what the finished material or product is to be used for. The specification of surface treatment must therefore state the highest permissible surface density of salts for each particular application.

The paint manufacturer should be able to provide information on the highest permissible surface density of salts. It should also be noted that ISO is at present working on recommendations for maximum permissible surface densities of various salts on steel for surface treatment.



The contents of the analysis case

- Conductivity Meter
CD-306010
- Syringe
CD-210021
- Bottle of distilled water for extraction of soluble salts from the test surface
CD-210023
- Graduated measuring beaker
CD-210025
- Box with 25 Bresle patches
CD-910505

Use the conductivity meter to measure the electrical conductivity of the extraction liquid before and after sampling. Select a suitable measurement range by the switch on the meter. The meter is temperature compensated, and can therefore be used for measurements at different temperatures.

The water quality should be at least Grade 3 in accordance with ISO 3696, with an electrical conductivity not exceeding 5 $\mu\text{S}/\text{cm}$. Distilled water will have an electrical conductivity of 1-2 $\mu\text{S}/\text{cm}$, while deionized water will have a conductivity of 2-4 $\mu\text{S}/\text{cm}$. If the conductivity of the water exceeds 5 $\mu\text{S}/\text{cm}$, the sensitivity and accuracy of the assessed salt concentrations will be considerably poorer, and so the use of such water is not recommended.

15 ml is the test volume to be used for each analysis.

The Bresle patches meet the requirements of ISO 8502-6