

INSTRUCTIONS FOR **HYDROCLOR-Q®**

Quantitative Test Kit for Organic Chlorine Contamination In Water and Water/Oil Mixtures

EACH KIT CONTAINS:

1. A break-top ampules containing 1 ml of mixing reagent.
2. A large glass vial containing extraction solvent and a white, powdered emulsion breaker.
3. A 10 cc plastic sampling syringe.
4. A plastic pipette.
5. A small glass vial containing a white drying agent.
6. Tube #1 - A plastic test tube with a white dispensing cap containing a colorless ampule (bottom) and a yellow-dotted, gray ampule (top).
7. Tube #2 - A plastic test tube with clear cap containing 7 ml of buffer solution and a red-green ampule.
8. A 1 ml polypropylene sampling syringe with a preset volume and a tissue wipe.
9. A plastic filtration funnel.
10. A plastic titration burette attached to a plastic screw cap.
11. A white, plastic syringe plunger rod.
12. A glass ampule contained in a cardboard sleeve and plastic tube designated as "Disposal Ampule".

READ CAUTION AND INFORMATION SECTIONS ON BACK BEFORE PERFORMING TEST. WEAR RUBBER GLOVES AND SAFETY GLASSES.

DIRECTIONS

1. SET-UP Remove contents from box. Check contents to ensure that all items are present and intact. Place the two plastic tubes and the large glass vial into the holder at the front of the box.

2. SAMPLE PREPARATION Read the Suggestions section concerning the sample to be tested. Carefully snap off the top of the break-top ampule containing the mixing reagent and pour the contents into the jar containing approximately 500-1000 ml (one pint-one quart) of the sample to be analyzed. Cap the jar and shake thoroughly until a uniform sample is observed.

3. Remove the cap from the large glass vial. Place the tip of the 10 cc sampling syringe into the test sample and slowly pull back on the plunger until it reaches the 10 cc mark. Dispense the entire contents of the syringe into the large glass vial and replace the cap tightly.

4. Shake the mixture continuously for 1 minute. Allow the mixture to settle until it has separated into distinct phases (approximately 3 minutes). Remove the cap from the large glass vial.

5. Remove the cap from the small glass vial containing the white drying agent. With the plastic pipette, transfer approximately one-third of the top layer (phase) from the large glass vial into the small vial. Do NOT remove any of the bottom layer. Shake the solution in the small vial containing the drying agent for 15 seconds. Let stand, allowing the drying agent to settle to the bottom of the vial.

6. SAMPLE INTRODUCTION Unscrew the white dispensing cap from Tube #1. Work the plunger on the empty 1 cc sampling syringe a few times to ensure that it slides easily. Place the tip of the syringe into the small vial and slowly pull back on the plunger until it reaches the stop and cannot be pulled further. Do NOT remove any of the white powder. Remove the syringe from the sample and wipe any excess liquid from the outside of the syringe with the enclosed tissue. Place the tip of the syringe into Tube #1 and dispense the entire contents by depressing the plunger. Replace the white dispensing cap securely on tube #1.

7. REACTION Break the bottom (colorless) ampule in the tube by compressing the sides of the tube. Mix thoroughly by shaking the tube vigorously for about 30 seconds. Break the top (gray) ampule in the tube and shake thoroughly for about 20 seconds. Allow the reaction to proceed for an additional 40 seconds (total of one minute), while shaking intermittently several times.

8. EXTRACTION Remove the caps from both tubes and pour the clear buffer solution from Tube #2 (clear cap) into Tube #1. Replace the white dispensing cap tightly on Tube #1 and shake vigorously for about 10 seconds. Vent the tube carefully by partially unscrewing the dispensing cap. Close securely and shake well for an additional 10 seconds. Vent again, tighten cap and stand tube upside down on its cap. Allow the phases to separate for a full two minutes.

9. ANALYSIS Place the plastic filtration funnel into Tube #2. Position Tube #1 over funnel and open nozzle on the dispensing cap. Be sure to point the nozzle away from the operator while opening it, and check that the nozzle is open completely before dispersing the clear solution. Dispense 5 ml of the clear solution through the filter into Tube #2 (up to the 5 ml line) by squeezing the sides of Tube #1. Close the nozzle on the dispensing cap on Tube #1 and remove the filter funnel from Tube #2.

10. Place the plunger rod into the titration burette and press until it snaps into place. Break off (do not pull off) the tip on the titration burette, insert the burette into Tube #2 and tighten the cap. Break the colored ampule and shake gently for 10 seconds. **Do NOT zero the plunger prior to analyzing the sample.**

11. Dispense titrant slowly by pushing down on the white plunger rod. Shake the tube continuously while adding titrant to mix the titrant with the solution. Continue adding titrant until the solution turns from yellow to light purple. An intermediate pink color may develop in the solution but should be disregarded. Continue titrating until a true light purple color is obtained. A dark purple color means the titration has been carried too far (see photo). Read the total chlorine concentration of the original oil sample directly on the titration burette at the black tip of the plunger rod. Record the total chlorine concentration immediately as the purple color will fade with time.

12. DISPOSAL Empty the titration burette into Tube #2 by completely depressing the plunger. Open the "Disposal Ampule" container and drop the ampule into Tube #2. Replace the cap on the test tube. Crush the ampule by squeezing the sides of the tube. Shake for 5 seconds. This reagent immobilizes the mercury so that the kit passes the EPA's TCLP test. See caution section below for additional information on disposal.

SUGGESTIONS FOR USING THE TEST KIT

- !** The HydroClor-Q kit is designed for testing water and oil/water mixtures. For accuracy, the sample should contain more than 70% water. Samples containing more oil (less water) may be tested accurately if the following correction is used:

$$\text{True Concentration} = \text{Reading Syringe} + \frac{(10 + \text{ml oil in sample})}{10}$$

For example, if the sample contained 6 ml water and 4 ml oil (60% water) and the reading off the syringe was 2000 ppm, then the true concentration would be:

$$2000 \left(\frac{10 + 4}{10} \right) = 2800$$

- ! For an accurate result with the Hydroclor-Q kit, it is important to obtain a representative sample of the water to be tested. Because any oil present will separate from the water, a truly representative sample may be difficult to obtain. Included in each Hydroclor-Q kit is an ampule containing a mixing agent which facilitates the formation of an oil-water mixture of the sample.
- ! If the sample does not contain an oil phase, Step #2 may be omitted.
- ! For samples that contain more than 80% oil, use Dexsil's Clor-D-Tect Q4000 kit, designed for testing chlorinated compounds in oil.
- ! The kit works well on all types of wastewater and oil/water mixtures including cutting fluids and antifreeze. Inorganic chloride from sea water or road salt will not interfere with the test. The test measures only the amount of organic chloride present.
- ! The kit should be examined upon opening to see that all of the components are present and that all the ampules (4) are in place and not leaking. The liquid in Tube #2 (clear cap) should be approximately ½ inch (1 cm) above the 5 ml line and the tube should not be leaking. The ampules are not intended to be completely full.
- ! Perform the test in a warm, dry area with adequate light. In cold weather, a truck cab is sufficient. If a warm area is not available, Step 7 should be performed while warming Tube #1 in palm of hand.
- ! Always crush the clear ampule in each tube first. If this sequence has not been followed, stop the test immediately and start over using another complete kit. When an incorrect testing sequence is followed, a false negative may result which may allow a contaminated sample to pass without detection.
- ! In Step 9, tip Tube #2 to an angle of only 45° to prevent the ampule holder from sliding out.

CAUTION

- ! When crushing the glass ampules, press firmly in the center of the glass ampule **ONCE**. Never attempt to recrush broken glass as it may come through the plastic and cut fingers.
- ! In case of accidental breakage or spillage onto skin or clothing, wash immediately with large amounts of water. All the ampules are poisonous and should not be taken internally.
- ! Do not carry kits on passenger aircraft.
- ! The gray ampule in the white-capped test tube contains metallic sodium. Metallic sodium is a flammable solid and is water reactive.
- ! Wear rubber gloves and safety glasses while performing test.
- ! Dispose of used kits properly. The mercury in Tube #2 is made insoluble by the disposable ampule and used kits will pass the USEPA TCLP test for land disposal. More stringent state and local regulations may apply. Contact Dexsil if you have any specific questions concerning disposal procedure.
- ! Read the Material Safety Data Sheet before performing the test.
- ! Keep Out of Reach of Children.

MANUFACTURER'S WARRANTY

This kit is warranted to be free of defects in material and workmanship until the expiration date stamped on the box. Manufacturer's sole and exclusive liability under this warranty shall be limited to replacement of any kit that is proven to be defective. Manufacturer shall not be liable for any incidental or consequential damages.

Reliable test results are highly dependent upon the care with which the directions are followed and, consequentially, cannot be guaranteed.

This kit is manufactured by **DEXSIL**[®] Corporation
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