Environmental Microbiology Laboratory:

Water Testing Job Aids

English Version

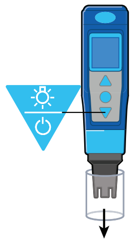
AMERICAN SOCIETY FOR MICROBIOLOGY

Contents

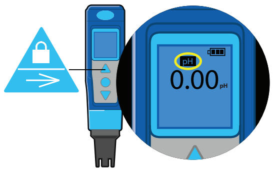
JOB AID

Calibration of Hach® Pocket Pro™+ Multi 2 Tester

1 Set the power to on and remove the sensor cap from the sensor.

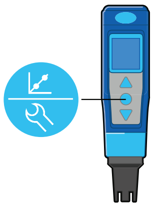


2 Press and hold the top button until “pH” shows.

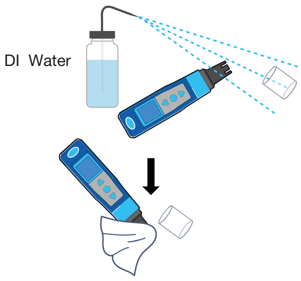


3 Press and hold the middle button to go to calibration mode.

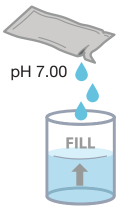
If “C1” shows on the bottom line, do not continue. The tester is in “custom calibration” mode and needs to be set to “auto calibration” mode.



4 Rinse the sensor and sensor cap with DI water. Gently blot dry with a lint-free cloth or tissue.

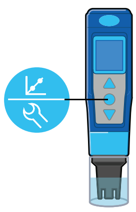


5 Pour the 7.00 pH standard into the sensor cap to the fill line.

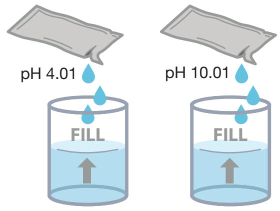


6 Submerge the sensor fully into the sensor cap.

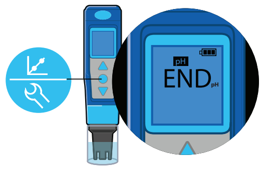
7 When the measurement is stable, the value will flash three times. Press the middle button to save the measurement.



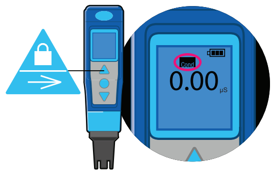
8 Repeat steps 4-7 with the 4.01 and 10.01 pH standards.



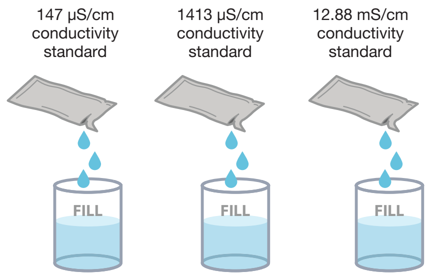
9 Press the middle button to go to continuous measurement mode. “END” will show on the display.



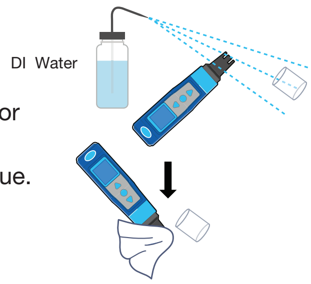
10 Press the top button until “Conductivity” shows.



11 Repeat steps 4-9 using the conductivity standards.



12 Rinse the sensor and sensor cap with DI water. Blot dry with a lint-free cloth or tissue.



ADDITIONAL NOTES

If calibrating for the first time or after a long period of dry storage, soak the sensor for several minutes in the first standard.

Air bubbles under the probe tip when submerged can cause slow stabilization or error in measurement. Gently shake the tester from side to side to remove air bubbles.

DI: distilled or deionized

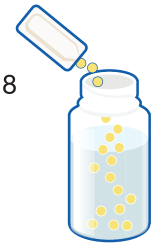
This job aid is adapted from the Hach® Pocket Pro™+ Multi 2 Tester User Manual. The “pH, Conductivity, Total Dissolved Solids, Salinity, and Temperature Measurement Using the Hach® Pocket Pro™+ Multi 2 Tester Standard Operating Procedure” provides additional detail about this method, including information on sample requirements, safety precautions, and quality control.

AMERICAN SOCIETY FOR MICROBIOLOGY

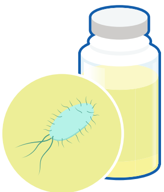
JOB AID

Detection of Total Coliforms and *Escherichia coli* in Water (IDEXX® Colilert-18)

1 Add the contents of one Colilert®-18 medium packet to vessel containing 100 ml of sample.



2 Cap the vessel and swirl to dissolve the medium.

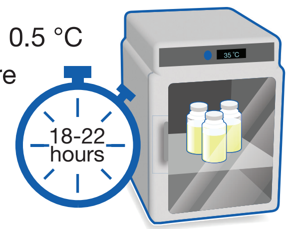


Positive control

Method blank

3 Prepare a positive control and method blank. See Quality Control below. Repeat steps 1 and 2 on these controls.

4 Incubate vessels at 35 ± 0.5 °C for 18 hours. If results are ambiguous, incubate up to an additional 4 hours.



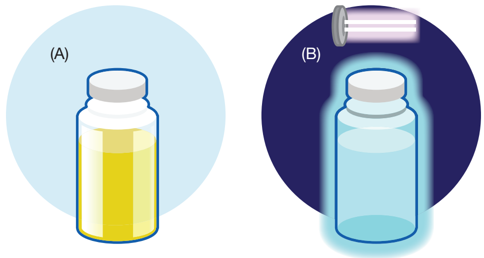
PBS: Phosphate Buffered Saline

QUALITY CONTROL

At minimum, each batch of samples must include a positive control and a method blank.

- **Positive control:** Sample vessel containing 100 ml of sterile PBS and *E. coli* positive control stock.
- **Method Blank:** Sample vessel containing 100 ml of sterile PBS only.

5 Examine sample for yellow color change under visible light (A). If yellow color change is present, examine for fluorescence under UV light (6-watt, 365 nm) (B).



6 Interpret results using these guidelines:

If no yellow color change under visible light, total coliforms and *E. coli* are not detected.

If yellow color change under visible light but no fluorescence under UV light, total coliforms are detected and *E. coli* are not detected.

If yellow color change under visible light and fluorescence under UV light, *E. coli* are detected.

ADDITIONAL NOTES

- Avoid direct exposure of skin to the UV light and do not look directly at the UV light.
- A Colilert-18 Comparator can be used to assist in distinguishing a minimal positive result from a not-detected result.

This job aid is adapted from the IDEXX Colilert®-18 product insert. The "Detection of Total Coliforms and *Escherichia coli* in Water Using IDEXX Colilert®-18 Standard Operating Procedure" provides additional detail about this method, including information on sample requirements, safety precautions, and quality control. Aseptic technique should be followed.

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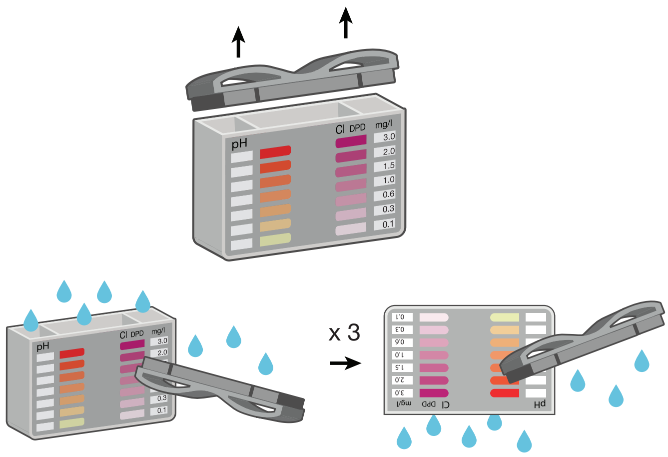
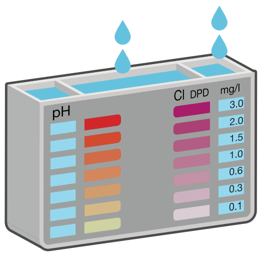
JOB AID

Free Chlorine Residual (FCR) Measurement (Lovibond® Pooltester)

1 Triple rinse sample compartments and lid with test water.

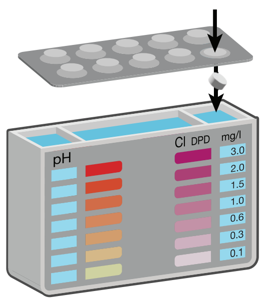


2 Completely fill the compartments with test water.

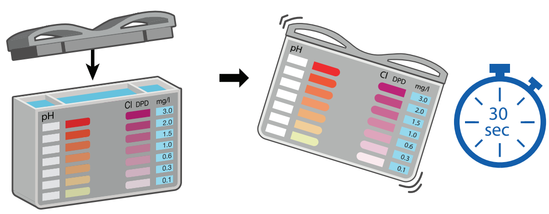


3 Add one DPD-1 Rapid tablet to the rightmost compartment containing sample.

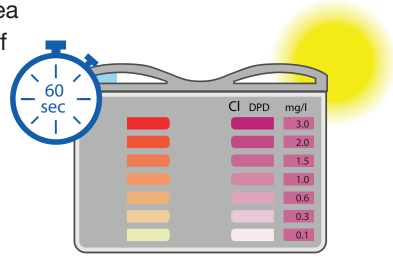
Do not touch the tablet.



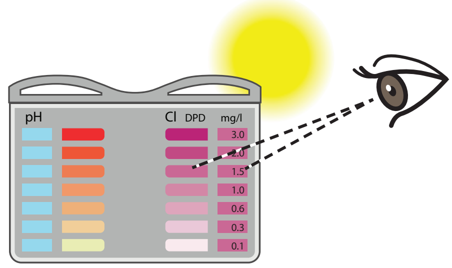
4 Securely close the lid. Shake the Pooltester for approximately 30 seconds, or until the tablet is mostly dissolved. Undissolved reagent will not affect accuracy.



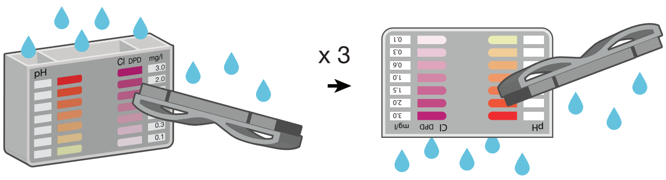
5 Read the chlorine result in a well-lit area within 60 seconds of reagent addition.



6 Compare the color of sample to the color-scale with numerical chlorine concentrations indicated. The color standard that most closely matches the color of the sample indicates the FCR (in mg/L). Concentration should be reported to one decimal place.



7 After reading the result, empty the contents of the sample compartment and triple rinse the compartment and lid with DI water.



ADDITIONAL NOTES

- This procedure must be performed at the site of sample collection.
- FCR values below 0.1 mg/L should be reported as <0.1 mg/L or "not detected". FCR values above 3.0 mg/L should be reported as >3.0 mg/L.
- If sample turns bright pink after DPD addition, then immediately becomes clear, record result as ">3.0 mg/L".

DI: distilled or deionized

This job aid is adapted from the Lovibond Pooltester Manual. The "Free Chlorine Residual Measurement Using the Lovibond® Pooltester Chlorine LR-pH Standard Operating Procedure" provides additional detail about this method, including information on sample requirements and safety precautions.

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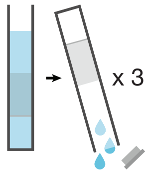
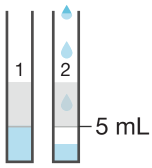
JOB AID

Free Chlorine Residual (FCR) Measurement (Hach® Color Disc Test Kit)

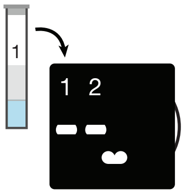
1 Triple rinse two viewing tubes and caps with test water.



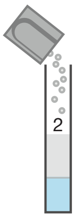
2 Fill each viewing tube to the 5 ml line with test water.



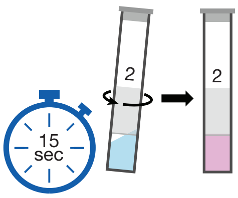
3 Cap one tube (“Tube 1”) and place in the left opening of the color comparator box.



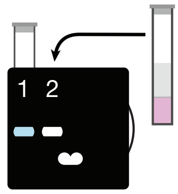
4 Add one 5 ml DPD Free Chlorine Reagent Powder Pillow to the second tube (“Tube 2”) and cap.



5 Swirl Tube 2 for approximately 15 seconds. Undissolved reagent will not affect test accuracy. A pink color change will be observed if free chlorine is present.

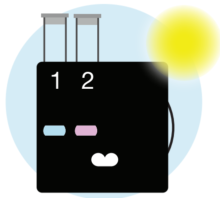


6 Place Tube 2 in the right opening of the color comparator box.



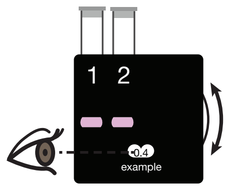
7 Read the test result within 1 minute of reagent addition.

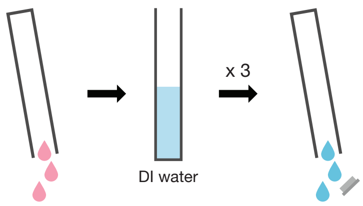
8 Read the test result in a well-lit area.



Rotate the color disc until the colors in Tube 1 and Tube 2 windows match. FCR (in mg/L) is indicated below the windows.

Result is shown in mg/L Cl_2. Concentration should be reported to one decimal place.





9 After reading the result, empty the contents of the viewing tubes and triple rinse the tubes and caps with DI water.

DI: distilled or deionized

ADDITIONAL NOTES

- This procedure must be performed at the site of sample collection.
- If sample color intensity is between two sequential color segments on the color disc, use the numerical value between the two segments. If the sample is not completely clear, but color is less intense than the 0.2 mg/L color segment, then a 0.1 mg/L result is valid.
- If no color change is observed, record result as “<0.1 mg/L” or “not detected.” If sample color is more intense than the 3.4 mg/L color segment, record result as “>3.4 mg/L.”
- If sample turns bright pink after DPD addition, then immediately becomes clear, record result as “>3.4 mg/L.”

This job aid is adapted from the Hach® Chlorine Test Manual for Test Kit CN-66. The “Free and Total Chlorine Residual Measurement Using the Hach® Chlorine Color Disc Test Kit Standard Operating Procedure” provides additional detail about this method, including information on sample requirements, safety precautions, and quality control.

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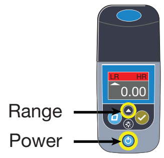
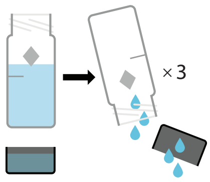
Free Chlorine Residual (FCR) Measurement (Hach® DR300 Pocket Colorimeter)

JOB AID

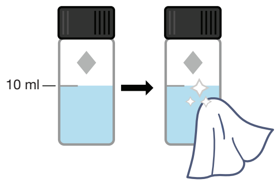
1 Press power button and set instrument to low range (LR).



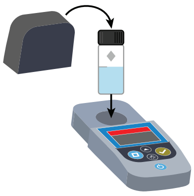
2 Triple rinse sample cell and cap with test water.



3 Fill sample cell to 10 ml mark with test water and cap the sample cell. Wipe sample cell with lint-free cloth or tissue.

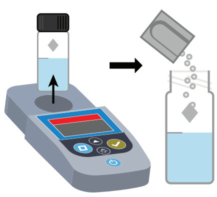


4 Insert sample cell into holder with diamond mark facing the keypad and cover with the instrument cap.

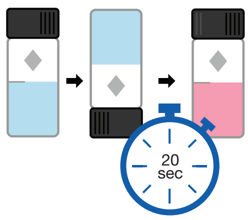


5 Press "Zero" button. The display will show "0.00."

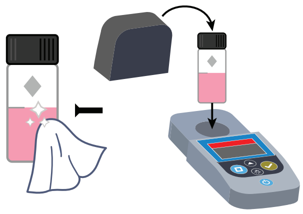
6 Add one 10 ml DPD Free Chlorine Reagent Powder Pillow to sample and cap cell.



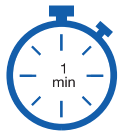
7 Invert the sample cell repeatedly for approximately 20 seconds to dissolve reagent. Undissolved reagent will not affect test accuracy. A pink color change will be observed if free chlorine is present.



8 Wipe sample cell with lint-free cloth or tissue. Insert sample cell into sample cell holder with diamond mark facing the keypad and cover with the instrument cap.

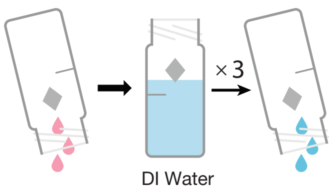


9 Read the test result within 1 minute of reagent addition.



10 Press "Read" button. Result is shown in mg/L Cl_2. Concentration should be reported to two decimal places.

11 After measurement is complete, empty the contents of the sample cell and triple rinse the cell and cap with DI water.



12 Press power button to turn the instrument off.

DI: distilled or deionized

QUALITY CONTROL

The Hach® DR300 must be verified using Hach® SpecCheck Secondary Gel Standards daily before use to ensure instrument is functioning properly.

ADDITIONAL NOTES

- This procedure must be performed at the site of sample collection.
- If the digital reading flashes "0.00" or "2.20" followed by "E-04," see corresponding Standard Operating Procedure.
- If sample turns bright pink after DPD addition, then immediately becomes clear, record result as ">2.00 mg/L."

This job aid is adapted from the Hach® DR300 Pocket Colorimeter User Manual. The "Free and Total Chlorine Residual (Low Range) Measurement. Using the Hach® DR300 Pocket Colorimeter Standard Operating Procedure" provides additional detail about this method, including information on sample requirements, safety precautions, and quality control.

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JOB AID

Ground Transportation of Water Samples for Microbiological Testing

1. After water sample collection, ensure the sample vessel is properly labeled, securely closed, and is not leaking.

2. Place the sample vessel inside a sealable, leakproof plastic bag. Each plastic bag should contain only one sample vessel.

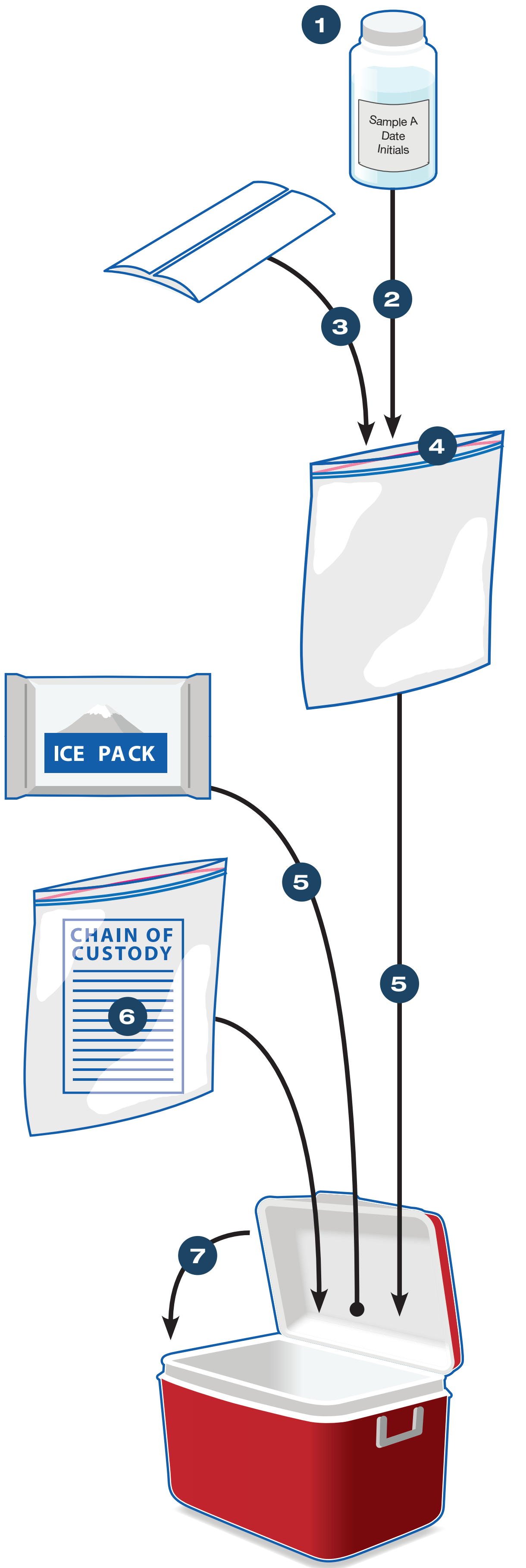
3. Fill remaining space in the plastic bag with absorbent material (e.g., paper towels).

4. Seal the plastic bag containing the sample vessel.

5. Place the sealed plastic bag containing the sample vessel inside a rigid cooler with ice packs or ice.

6. Complete the Chain of Custody Form and place it inside a sealable, leakproof plastic bag. Tape the sealed bag to the inside of the cooler lid.

7. Close the cooler lid tightly. Once sample collection is complete, transport samples to the local laboratory within the required sample hold time.



ADDITIONAL NOTES

- Procedures may vary based on local and national guidelines for transporting environmental samples. If shipping samples by air or commercial service, adhere to local, national, or international guidelines on sample transport.
- Generally, water samples should be transported at 2-8 °C to a laboratory and processed within 6 hours of collection. If not possible, maintain cold storage and process the sample within 24 hours.
- Some microorganisms have different temperature requirements for storage; relevant SOPs and/or laboratory testing personnel should be consulted prior to sampling.

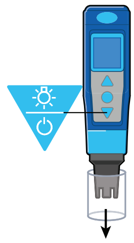
This job aid is adapted from the “Ground Transportation of Water Samples for Microbiological Testing Standard Operating Procedure” which provides additional detail about this method, including information on sample requirements, safety precautions, and quality control.

AMERICAN SOCIETY FOR MICROBIOLOGY

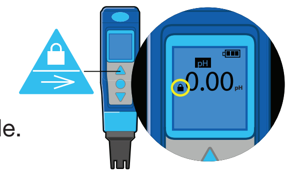
pH, Conductivity, Total Dissolved Solids, Salinity, and Temperature Measurement (Hach® Pocket Pro™+ Multi 2 Tester)

JOB AID

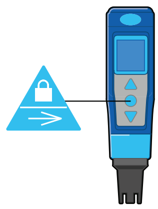
1 Press power button to turn on. Remove the sensor cap from the sensor.



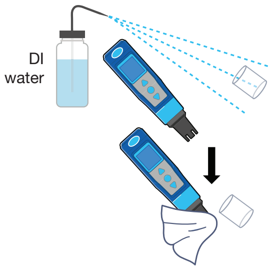
2 If the lock icon shows on the display, press 🔒 to go to continuous measurement mode.



3 Press and hold the right directional arrow to select the parameter (e.g., pH) to measure.



4 Rinse the sensor and sensor cap with deionized water and blot dry with a lint-free cloth or tissue.

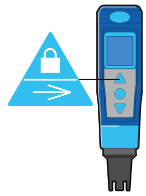


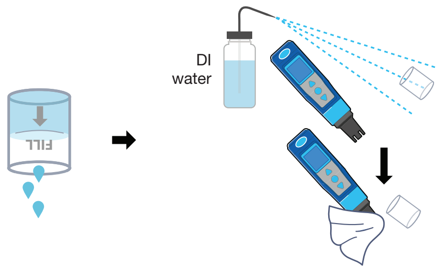
5 Collect a water sample in the sensor cap to the fill line.

6 Submerge the sensor fully into the sensor cap.

7 The measured value will be displayed on the top line. The lock icon 🔒 shows on the display when the measurement is stable.

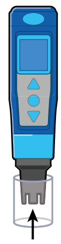
8 To measure additional parameters, press and hold the right directional arrow to select the parameter.



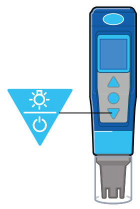


9 After measurements are recorded, empty contents of the sensor cap. Rinse the sensor and sensor cap with DI water and blot dry with a lint-free cloth or tissue.

10 Place the sensor cap on the sensor.



11 Press power button to turn the instrument off.



DI: distilled or deionized

ADDITIONAL NOTES

· This procedure should be performed at the site of.

sample collection.

• Temperature is continuously displayed regardless of parameter selected. If water temperature data are being collected, record it first as it may be impacted by ambient temperature.

• Air bubbles under the probe tip when submerged can cause slow stabilization or error in measurement. Gently shake the tester from side to side to remove air bubbles.

This job aid is adapted from the Hach® Pocket Pro™+ Multi 2 Tester User Manual. The "pH, Conductivity, Total Dissolved Solids, Salinity, and Temperature Measurement Using the Hach® Pocket Pro™+ Multi 2 Tester Standard Operating Procedure" provides additional detail about this method, including information on sample requirements, safety precautions, and quality control.

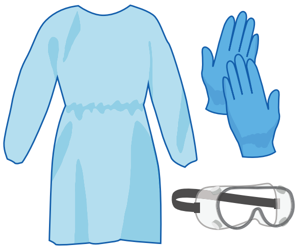
AMERICAN SOCIETY FOR MICROBIOLOGY

JOB AID

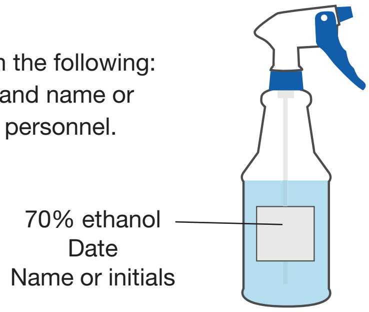
Preparation of General Disinfectant Solutions

To make a 70% ethanol disinfectant solution:

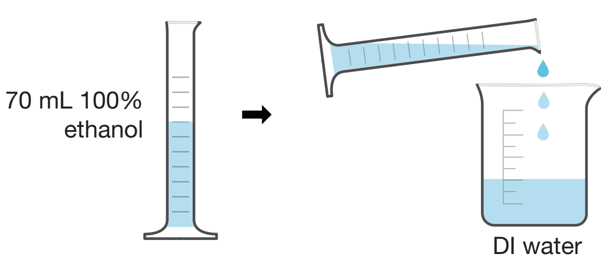
1. Don personal protective equipment (PPE).



2. Label the bottle with the following: 70% ethanol, date, and name or initials of laboratory personnel.



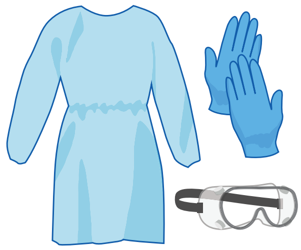
3. In a beaker, add 70 ml of 100% ethanol for every 30 ml of sterile DI water. Final concentration is 70% (v/v).



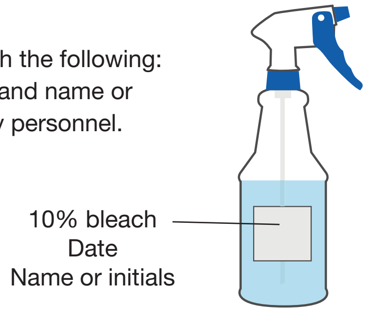
4. Pour the solution into a spray or squeeze bottle.

To make a 10% bleach disinfectant solution:

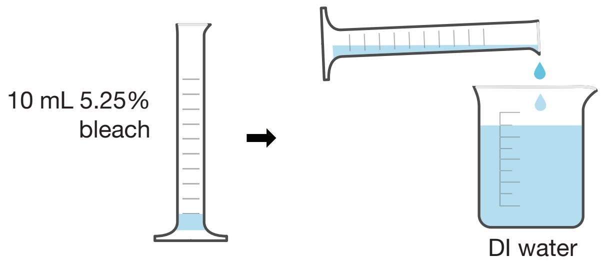
1. Don personal protective equipment (PPE).



2. Label the bottle with the following: 10% bleach, date, and name or initials of laboratory personnel.



3. In a beaker, add 10 ml of 5.25% bleach for every 90 ml of sterile DI water. Final concentration is 0.525% (w/v).



4. Pour the solution into a spray or squeeze bottle.

DI: distilled or deionized

ADDITIONAL NOTES

- Stock bleach solution concentrations can vary therefore volumes may need to be adjusted to result in a 0.525% (w/v) solution.
- Volumes can be scaled (e.g., 30 ml 5.25% bleach into 270 ml sterile DI water).
- Do not use bleach together with ammonia or other cleaners.
- Prepare and use disinfectant solutions in well-ventilated areas and store away from open flames.
- Prepare new solutions at least weekly.

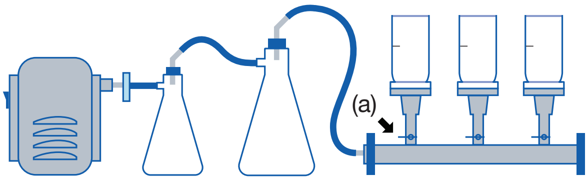
This job aid is adapted from the "Preparation of General Disinfectant Solutions for Environmental Microbiology Laboratories Standard Operating Procedure" which provides additional detail about this method, including information on sample requirements, safety precautions, and quality control.

AMERICAN SOCIETY FOR MICROBIOLOGY

JOB AID

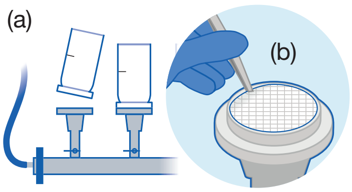
Quantification of *Escherichia coli* (Membrane Filtration)

1 Set up membrane filtration assembly including manifold, sterile filter funnel cylinder and base, and pump. Ensure the manifold valve is set to "closed" position (a).

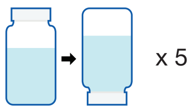


2 Flame sterilize forceps. Allows forceps to cool completely.

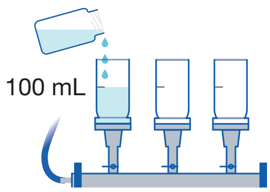
3 Carefully remove a membrane filter from packaging using sterilized forceps. Remove the filter funnel cylinder (a), place membrane filter grid-side up on the base (b), and replace filter funnel cylinder.



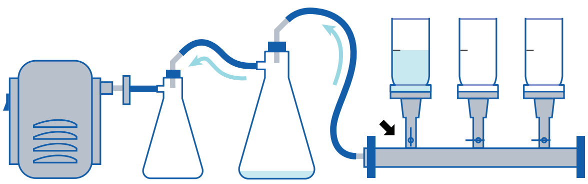
4 Gently invert sample vessel five times to mix.



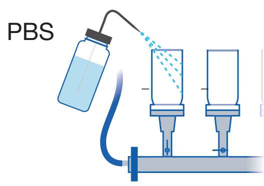
5 Pour or pipet a known volume of sample (generally 100 ml) into the filter funnel cylinder.



6 Turn the manifold valve to the "open" position. Turn on the pump to enable vacuum filtration of sample through the membrane filter.



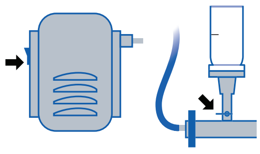
7 Once the sample has filtered, rinse sides of the funnel cylinder with PBS (phosphate buffered saline) and allow vacuum filtration of the PBS through the membrane filter.



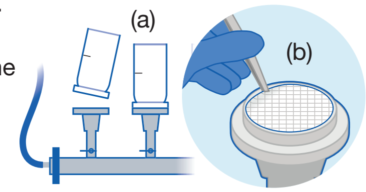
QUALITY CONTROL

A positive control consists of a known amount of an *E. coli* reference strain in 100 ml PBS. A method blank consists of 100 ml PBS. See Standard Operating Procedure for details about preparing controls.

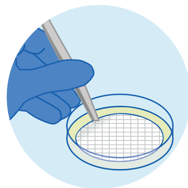
8 Turn the manifold valve to the "closed" position. Turn off the pump.

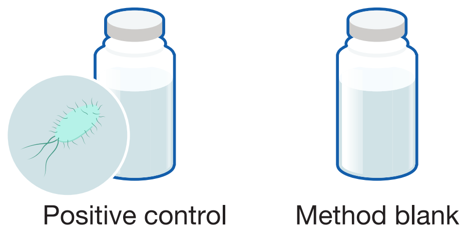


9 Flame sterilize forceps. Allow forceps to cool completely. Remove the filter funnel cylinder (a) and use the sterilized forceps to remove the membrane filter from the base (b).



10 Transfer the membrane filter onto pre-prepared *E. coli* culture medium.

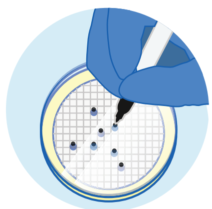




11 Prepare and assay a positive control and method blank.

12 Incubate sample and quality control plates according to culture medium manufacturer's instructions.

13 After incubation, count and record colony forming units (CFU) showing *E. coli*-characteristic growth per manufacturer's instructions.



ADDITIONAL NOTES

- If samples are turbid or concentrations are expected to be high, a smaller volume of sample or a sample dilution can be assayed. If this is done, back-calculation to CFU/100 ml is required. See SOP for details.
- The *E. coli* medium used should be chosen based on factors including scope of work, resources, and availability.

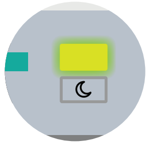
The "Quantification of *Escherichia coli* in Water Using Membrane Filtration Standard Operating Procedure" provides additional detail about this method, including information on sample requirements, safety precautions, and quality control. Aseptic technique should be followed.

AMERICAN SOCIETY FOR MICROBIOLOGY

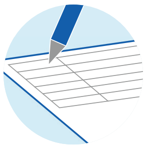
Quantification of Total Coliforms and *Escherichia coli* in Water (IDEXX Colilert®-18 Quanti-Tray®/2000)

JOB AID

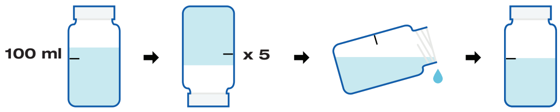
1 Turn on sealer. The light will turn green when sealer is ready for use.



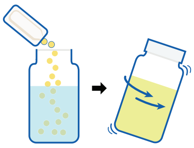
2 Record pertinent information on bench sheet (e.g., sample ID, media lot number).



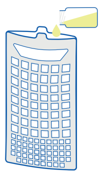
3 If sample volume is >100 ml, gently invert sample vessel five times to mix, then carefully pour off excess to 100 ml mark.

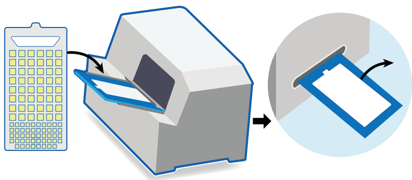


4 Add the contents of one Colilert®-18 media packet to vessel containing 100 ml of sample. Cap and swirl vessel to dissolve the medium.



5 Carefully pour the mixture into a tray labeled with sample ID, date, and name or initials of laboratory testing personnel. Discard vessel in a biohazard waste container.



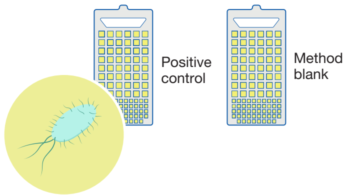


6 Place tray in the rubber insert and gently push insert into sealer. Remove insert from back of sealer once it stops moving.

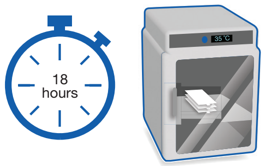
QUALITY CONTROL

A positive control consists of a known amount of an *E. coli* reference strain in 100 ml PBS. A method blank consists of 100 ml PBS. See Standard Operating Procedure for details about preparing controls.

7 After all samples are assayed, prepare and assay positive control and method blank.

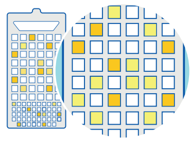


8 Incubate trays at 35.0 °C ± 0.5 °C for 18 hours. Record time and incubator temperature.

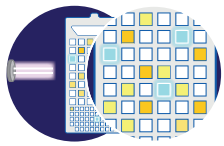


9 After incubation,

a) Mark, count, and record the number of large and small yellow wells (total coliforms).

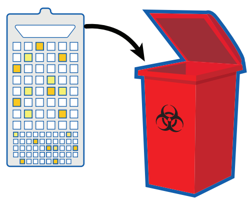


b) Mark, count, and record the number of large and small wells that are yellow and fluorescent under a 6-Watt, 365-nm ultraviolet light *(E. coli)*.



If the results are ambiguous, trays can be incubated up to an additional 4 hours to allow the color and/or fluorescence to intensify. Do not exceed 22 hours incubation in total.

10 Discard trays in biohazard waste container.



ADDITIONAL NOTES

- If samples are turbid or concentrations are expected to be high, a smaller volume of sample diluted in diluted in phosphate buffered saline (PBS) can be assayed. See Standard Operating Procedure for details.
- One or two empty wells will not affect the test interpretation if the entire sample is in the tray.
- A partially filled well is interpreted the same way as a full well. Empty wells should be scored as non-detect.

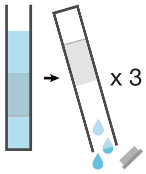
This job aid is adapted from the IDEXX Colilert®-18 product insert. The "Quantification of Total Coliforms and *Escherichia coli* in Water Using the IDEXX Colilert®-18 and Quanti-Tray®/2000 Standard Operating Procedure" provides additional detail about this method, including information on sample requirements, safety precautions, and quality control. Aseptic technique should be followed.

AMERICAN SOCIETY FOR MICROBIOLOGY

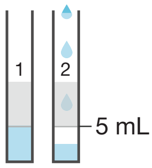
JOB AID

Total Chlorine Residual (TCR) Measurement (Hach® Color Disc Test Kit)

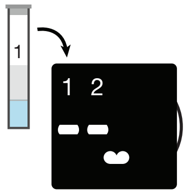
1 Triple rinse two viewing tubes and caps with test water.



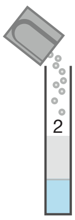
2 Fill each viewing tube to the 5 ml line with test water.



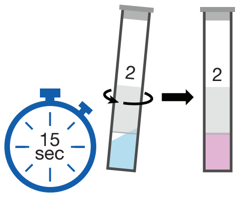
3 Cap one tube (“Tube 1”) and place in the left opening of the color comparator box.



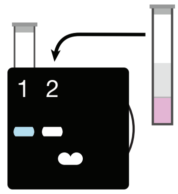
4 Add one 5 ml DPD Total Chlorine Reagent Powder Pillow to the second tube (“Tube 2”) and cap.



5 Swirl Tube 2 for approximately 15 seconds. Undissolved reagent will not affect test accuracy. A pink color change will be observed if total chlorine is present.

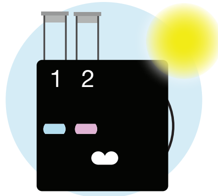


6 Place Tube 2 in the right opening of the color comparator box.



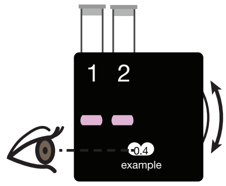
7 Read the test result 3 to 6 minutes after reagent addition.

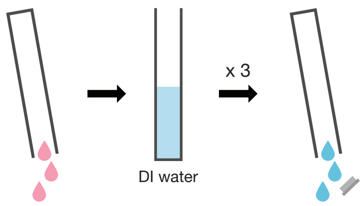
8 Read the test result in a well-lit area.



Rotate the color disc until the colors in Tube 1 and Tube 2 windows match. TCR (in mg/L) is indicated below the windows.

Result is shown in mg/L Cl_2. Concentration should be reported to one decimal place.





9 After reading the result, empty the contents of the viewing tubes and triple rinse the tubes and caps with DI water.

DI: distilled or deionized

ADDITIONAL NOTES

- This procedure must be performed at the site of sample collection.
- If sample color intensity is between two sequential color segments on the color disc, use the numerical value between the two segments. If the sample is not completely clear, but color is less intense than the 0.2 mg/L color segment, then a 0.1 mg/L result is valid.
- If no color change is observed, record result as “<0.1 mg/L” or “not detected.” If sample color is more intense than the 3.4 mg/L color segment, record result as “>3.4 mg/L.”
- If sample turns bright pink after DPD addition, then immediately becomes clear, record result as “>3.4 mg/L.”

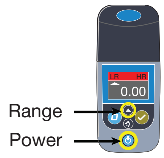
This job aid is adapted from the Hach® Chlorine Test Manual for Test Kit CN-66. The “Free and Total Chlorine Residual Measurement Using the Hach® Chlorine Color Disc Test Kit Standard Operating Procedure” provides additional detail about this method, including information on sample requirements, safety precautions, and quality control.

AMERICAN SOCIETY FOR MICROBIOLOGY

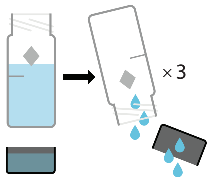
JOB AID

Total Chlorine Residual (TCR) Measurement (Hach® DR300 Pocket Colorimeter)

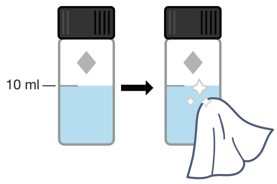
1 Press power button and set instrument to low range (LR).



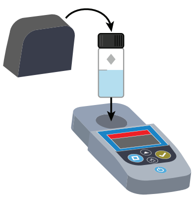
2 Triple rinse sample cell and cap with test water.



3 Fill sample cell to 10 ml mark with test water and cap the sample cell. Wipe sample cell with lint-free cloth or tissue.

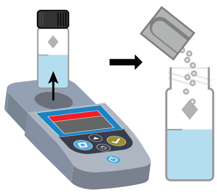


4 Insert sample cell into holder with diamond mark facing the keypad and cover with the instrument cap.

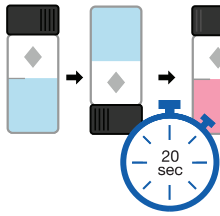


5 Press "Zero" button. The display will show "0.00."

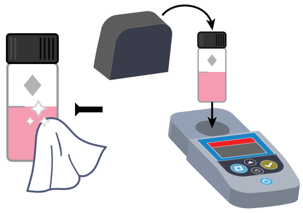
6 Add one 10 ml DPD Total Chlorine Reagent Powder Pillow to sample and cap cell.



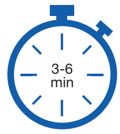
7 Invert the sample cell repeatedly for approximately 20 seconds to dissolve reagent. Undissolved reagent will not affect test accuracy. A pink color change will be observed if total chlorine is present.



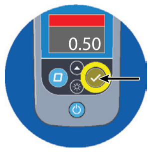
8 Wipe sample cell with lint-free cloth or tissue. Insert sample cell into sample cell holder with diamond mark facing the keypad and cover with the instrument cap.



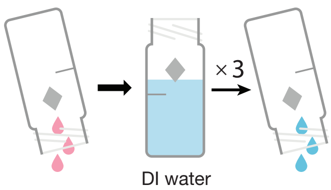
9 Read the test result 3 to 6 minutes after reagent addition.



10 Press "Read" button. Result is shown in mg/L Cl_2. Concentration should be reported to two decimal places.



11 After measurement is complete, empty the contents of the sample cell and triple rinse the cell and cap with DI water.



12 Press power button to turn the instrument off.

DI: distilled or deionized

QUALITY CONTROL

The Hach® DR300 must be verified using Hach® SpecCheck Secondary Gel Standards daily before use to ensure instrument is functioning properly.

ADDITIONAL NOTES

- This procedure must be performed at the site of sample collection.
- If the digital reading flashes "0.00" or "2.20" followed by "E-04," see corresponding Standard Operating Procedure.
- If sample turns bright pink after DPD addition, then immediately becomes clear, record result as ">2.00 mg/L."

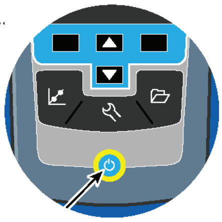
This job aid is adapted from the Hach® DR300 Pocket Colorimeter User Manual. The "Free and Total Chlorine Residual (Low Range) Measurement Using the Hach® DR300 Pocket Colorimeter Standard Operating Procedure" provides additional detail about this method, including information on sample requirements, safety precautions, and quality control.

AMERICAN SOCIETY FOR MICROBIOLOGY

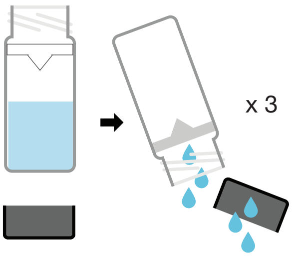
JOB AID

Turbidity Measurement (Hach® 2100Q Portable Turbidimeter)

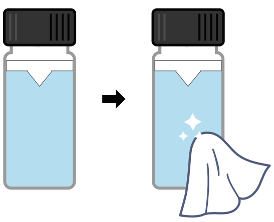
1 Press power button to turn on..



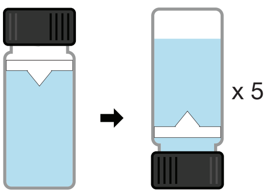
2 Triple rinse sample cell and cap with test water.



3 Fill sample cell to line with test water and cap. Wipe sample cell with lint-free cloth or tissue.



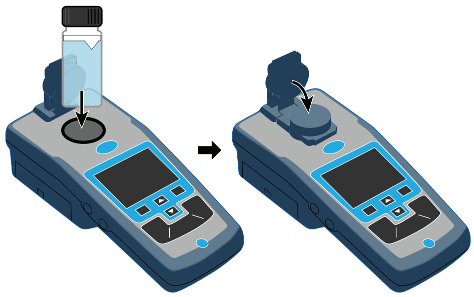
4 Gently invert sample cell 5 times to mix.



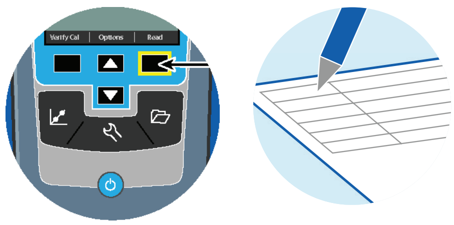
QUALITY CONTROL

The Hach® 2100Q Portable Turbidimeter must be calibrated and verified using Hach® Turbidity standards before each daily use to ensure instrument is functioning properly.

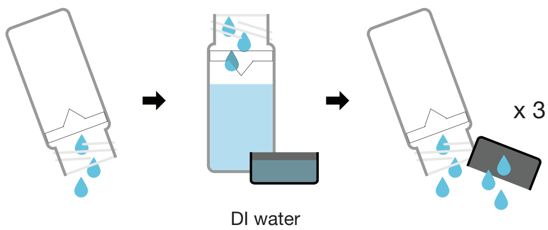
5 Insert sample cell into instrument compartment so that orientation mark aligns with front of compartment. Close the lid of the turbidimeter.



6 Press "Read." Result is shown in NTU.



7 After measurement is complete, empty the contents of the sample cell and triple rinse the cell and cap with DI water.



8 Press power button to turn the instrument off.

This job aid is adapted from the Hach® 2100Q Portable Turbidimeter User Manual. The "Turbidity Measurement Using the Hach® 2100Q Portable Turbidimeter Standard Operating Procedure" provides additional detail about this method, including information on sample requirements, safety precautions, and quality control.

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