



VIQUA Microbial Testing Program

Testing methodology

VIQUA has tested and validated presence-absence test 9221.D2 for the purpose of this program. In a validation study, this method had equivalent results in comparison to membrane filtration methods using m Endo Agar LES media across approximately 100 test runs.

Test function

The culture medium (i.e., dehydrated powder in the bottle) contains lactose as a carbohydrate source, while bromocresol purple is a pH indicator.

Once the water sample is added to the bottle, bromocresol purple gives the medium a purple color. If bacteria (total coliform) are present in the water, they will ferment lactose, producing acid and gas, which changes the pH and causes the sample to turn yellow.



Solution pH 6.83

Control or total coliform ≤ 1 colony-forming unit (CFU) per 100 mL

Solution pH 4.79

Total coliform ≥ 1 colony-forming unit (CFU) per 100 mL

Drawing the sample

One of the most critical components in the testing process is correctly drawing the bacteria sample. As the organisms targeted are commonly found in the environment, poor sampling practices can lead to false positive tests. Follow these processes to draw an effective sample:

- 1. Identify the sampling location.** Choose a location that's representative of a drinking water source, such as a kitchen or bathroom faucet. Be sure the location is after any existing treatment and does not bypass any equipment in the treatment train. Ensure the testing location has an easily removable aerator.
- 2. Thoroughly wash your hands** with soap and water or put on a pair of latex gloves.
- 3. Remove the aerator or any other faucet attachments** that may promote the growth of aerobic bacteria.
- 4. Sanitize the faucet**, using one of these methods:
 - Thoroughly wipe the outer and inner edges with a disinfecting (bleach or alcohol) wipe.
 - Mix 500 mL of water with 1 tablespoon of unscented bleach in a small cup. Submerge the end of the faucet in the cup for two minutes (120 seconds).
 - Treat the faucet with a small flame source (torch). CAUTION: As many materials used today are plated plastics, this method is not recommended unless you are certain the material used is heat resistant.
- 5. Flush the water line** by allowing cold water to run for 5 minutes.
- 6. Reduce the flow of water** to a slow, steady stream.
- 7. Remove the lid of the bottle.** DO NOT touch the inside of the lid or the inside of the bottle with your fingers, as this will lead to a positive test.
- 8. Fill the bottle** to the shoulder, replace lid, and tighten.
- 9. Shake well** for 30 seconds and label the bottle with:
 - Location and homeowner of well water sample
 - Date sample was taken
 - Initials of person who performed the test
 - Date placed in incubator
- 10. Store for transport and incubation.**

Storing and transporting the sample

Since the presence-absence test uses a growth medium (bacteria food source), the general risk associated with storing and transport are minimized. Make sure that you keep the test:

- Out of direct sunlight as the sun's UV rays could inactivate the bacteria
- At a temperature above freezing

Incubating the test

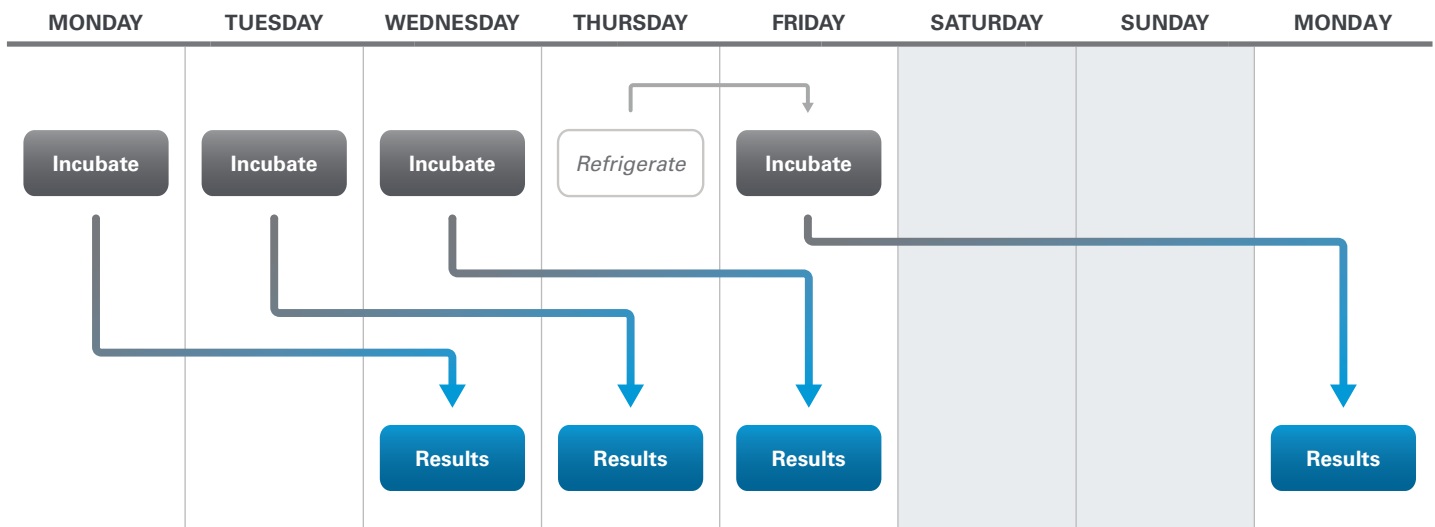
Set your incubator to the optimal range for bacteria growth: 30° to 35°C (85° to 95°F). Incubation below these temperatures will slow the rate of bacteria production, and anything above this range may destroy viable bacteria.

Place the test in the incubator and leave for 48 hours. After 48 hours, if the sample is still purple but has a significant amount of gas formation or calcification (white powder settling or cloudiness), continue to incubate for another 24 hours. Gas formation and calcification can be indicative of biological activity.

As many businesses do not operate on weekends, some challenges may arise in maintaining the 48- to 72-hour cycle. In these scenarios, tests drawn on Thursdays can be refrigerated for incubation on Fridays, delivering results on Mondays.



Sample incubation calendar



Interpreting the results

The transition from purple to yellow is a function of microbial load and the rate at which the bacteria is growing in the medium. Therefore, in some cases, you may not see a vibrant yellow color. Any change in color is representative of a change in pH, and thus, is a presumptive positive reading.

A best practice for interpreting results of a presence-absence test is to maintain a control sample. Fill a sample bottle with a known source of bacteria-free water (distilled or treated via reverse osmosis). Compare all incubated tests to the control.



If at 48 hours, a change is suspected, incubate for an additional 24 hours.
Remember: Any color change is a sign of acid production and change in pH.

Sample disposal

You can dump samples down the drain, as they are safe for septic systems.

Reordering tests

To reorder test bottles, email customercare@viqua.com and provide your requested volume. Order in quantities of 100 for ease of packaging and shipping. It typically takes three business days to process orders, plus shipping time.