



# **How to Test**

## **BACTOSURE DUO /**

## **BACTOSURE PRO**

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## 1 BEFORE YOU START

Once your Bactosure account is set up, you can begin the sample collection process.

Sample collection must be recorded by either using the Bactosure app downloaded onto your mobile phone or scanning the QR code on the sample bag. Samples that have not been recorded using the Bactosure app or the QR code cannot be processed on the Bactosure testing device.

### 1.1 USING THE APP

The Bactosure app is an easy way to keep track of sampling and testing, especially if you want to access your results primarily on a mobile device. Using the Bactosure app is optional – it is not necessary for collecting samples and viewing test results.

Once you are logged in on the Bactosure app, select Collect Samples on the home screen. Follow the sample collection instructions.

### 1.2 USING THE QR CODE

As an alternative, the QR code will direct you to a secure webpage to complete your sample collection and view test reports. You will need to scan the QR code using your phone, tablet or computer camera and enter your registered email address and password to log in.

## 2 SAMPLE COLLECTION

**Note: Ensure that all sample collection procedures follow best practice to avoid contamination and ensure accurate results.**

### 2.1 STEP 1: FLUSH AND STERILISE THE TAP

1. If you are collecting the water from the tap, run the tap for at least 2 minutes to flush out any stagnant water that might contain elevated levels of bacteria.
2. Remove any attachments from the tap (e.g. filters or aerators).
3. Sterilise the tap by heating it with a flame (such as a cigarette lighter) for 15 seconds, or use an alcohol wipe if the tap is unsuitable for flaming.

### 2.2 STEP 2: PREPARE FOR SAMPLE COLLECTION

1. **Wear disposable gloves** to prevent contamination.
2. **Sanitise your gloves** using an alcohol-based hand sanitiser (70-80% ethanol).
3. Gather the sample collection kit, which includes the sample bag and necessary tools.


### 2.3 STEP 3: COLLECT THE WATER SAMPLE

1. Ensure the sample bag contains a white tablet or powder to neutralise possible chlorine in the water. If the tablet is missing, contact Bactosure support at **bactosure.com/support**.
2. Tear the top of the sample bag along the perforated line using the white tabs to open it.
3. Run the tap at a pencil width flow. Hold the sample bag under the tap and allow water to fill the bag up to the **100 mL** line.

**Important: Avoid touching the inside of the bag with the tap or your fingers to prevent contamination.**

4. Remove any excess air from the bag before sealing it. Seal the bag by holding the yellow wire tags on the sides and quickly twirling the bag over the top of itself at least three times. Twist the wire sides together to seal.

### 2.4 STEP 4: RECORD SAMPLE DETAILS

1. Enter the following details:
  - **Water Supply ID (optional):** This is the unique identifier for the water supply (normally assigned by a regulator such as the state's health department or Taumata Arowai in New Zealand).
  - **Location:** Verify or update the GPS location of the sample collection point. If there is a discrepancy in the location, click  to update the current location.
  - **Time:** Ensure the correct date and time are recorded.
2. Tap the label on the sample bag against the back of the mobile device to complete the sample collection. Every mobile device has a different location for reading and writing data wirelessly.

**Note:** The Bactosure app uses Near Field Communication (NFC) to store data on the sample bag. While NFC is similar to the technology used in Apple Pay and Google Pay, it is used here solely for communicating with the sample bag and does not access any payment data on your device. The NFC antenna on most mobile devices is typically located at the rear, near the top or centre of the device.

If you are using the app, you must have NFC enabled on your device. You can change this setting on your mobile device by selecting “Settings” and searching for “NFC”.

**Note:** Payment is required for community testing where the user does not have a Bactosure subscription and is performing a one-off test. In this case, the user must click Proceed to Payment. If the user has a current Bactosure subscription, the sample will have been prepaid and payment will not be required.

## 2.5 STEP 5: STORE SAMPLE

1. Make sure the sample bag is properly sealed to prevent leaks.
2. If you are not testing the sample for an hour or more, store the sample at a temperature of 2-8°C until you are ready for testing.
3. Please note that the test will not run if the sample is more than 1 hour old and has not been chilled.

**Note: Testing must commence within 24 hours of sample collection. Samples that are older than 24 hours cannot be processed by the Bactosure testing device.**

### 3 SAMPLE TESTING

**Before you begin: Ensure that you are working in a clean and well-lit area. The testing room should be between 2°C and 30°C.**

#### 3.1 STEP 1: PREPARING FOR SAMPLE TESTING

1. Wear disposable gloves.
2. Sanitise your gloves using a reputable alcohol-based hand sanitiser.

#### 3.2 STEP 2: POWERING THE DEVICE

1. Open the lid of the device and locate the power switch.
2. Ensure that the device is turned ON.

#### 3.3 STEP 3: TRACEABILITY MICROCHIP SCANNING

1. Press the **Start** button on the device.
2. Scan the sticker located on the sample bag by touching it against the front of the device on the following symbol:
3. Once scanned, the device will allocate your sample a testing chamber in the device.
4. The device will light up clearly, showing which chamber to use.



#### 3.4 STEP 4: CLEANING THE DEVICE

1. Gently clean the inside of the testing chamber using an alcohol wipe, included in the testing kit. Use the tweezers provided in the testing kit to hold the alcohol wipe to clean the inside of the chamber.
2. You may also spray the inside of the testing chamber with 70-80% alcohol and wipe out with a lint free paper towel. Ensure that the glass at the bottom of the testing chamber is clean.

**Note: 70-80% alcohol solution provides the most effective properties for inactivation of bacteria. Stronger ethanol solutions may be less effective and could damage the device.**

#### 3.5 STEP 5: CHECKING SAMPLE VOLUME

1. Check that the sample bag contains 100 mL of liquid by using the line printed on the bag. The easiest way to do this is to place the bag on a flat surface and view the water level at eye level. Make sure the water level lines up with the mark on the bag when viewed at eye level. Look at the bottom of the curve on the surface of the water (called the meniscus). This ensures an accurate measurement.

**Note: Avoid touching the inside of the bag to prevent contamination.**

#### 3.6 STEP 6: ADDING THE REAGENT

1. Retrieve the reagent packet and check its expiration date.
2. If within the valid date range, gently shake the reagent packet, tear it open and pour its entire contents into the sample bag. Avoid spilling any reagent.

**Note:**

- ***Never use a reagent packet that has expired as this will likely impact the test results.***
- ***Use clean blades or scissors that have been sterilised with an alcohol wipe if you need to cut the reagent packet.***

### 3.7 STEP 7: SEALING THE SAMPLE BAG

1. To seal the bag, hold the wire tabs on the sides and quickly twirl the bag over the top of itself at least three times. Bring both wire sides together and twist to seal.

### 3.8 STEP 8: MIXING THE SAMPLE

1. Vigorously shake the sample bag until all the reagent powder has dissolved completely in the liquid sample.
2. Clean the exterior of the bag using fresh tissue paper and discard the tissue in general waste.

### 3.9 STEP 9: INSERTING THE SAMPLE BAG

1. Carefully place the sample bag inside the allocated testing chamber. Remove excess air from the sample bag if it does not easily fit inside the test device.

### 3.10 STEP 10: RUNNING THE TEST

1. Click Start on the display.
2. Securely close the lid of the device.

***Note: The device can be opened briefly to run other tests simultaneously using the other testing chamber(s). It is important to close the lid of the device at all other times throughout the testing process to produce the most accurate results.***

3. The device will beep to notify you when the test is completed.

## 4 INTERPRETING RESULTS

### 4.1 VIEWING THE RESULTS

1. Go to [bactosure.com](https://bactosure.com) and click the **Login** button to enter your credentials.
2. Click on the **View Tests** menu.
3. Use the information below to interpret the results.

### 4.2 INTERPRETING RESULTS

If your test result is positive for E. coli, the following tables provide more detailed information about the associated health risks (Note that MPN and CFU are often used interchangeably):

#### 4.2.1 HEALTH RISK SCORE FOR E. COLI IN DRINKING WATER (AS RECOMMENDED BY WHO)

CFU (Colony Forming Unit)/100 mL of water	Health Risk
0	No risk
1-10	Low risk
10-100	Intermediate risk
100-1000	High risk
>1000	Very high risk

#### 4.2.2 HEALTH RISK SCORE FOR E. COLI IN SWIMMING WATER (AS RECOMMENDED BY THE NEW ZEALAND MINISTRY FOR THE ENVIRONMENT)

CFU (Colony Forming Unit)/100 mL of water	Category
130 or less	Excellent, Good, or fair
More than 130	Intermittent
More than 260	Poor

**Disclaimer:** The data provided in these tables are meant for estimation purposes only. For detailed information and guidelines, please refer to the WHO and local water regulations relevant to your area.



## 5 INACTIVATING SAMPLES

To safely inactivate and discard the sample, follow the steps provided below:

### 5.1 STEP 1: SAFETY PRECAUTIONS

1. Put on a new pair of disposable gloves to ensure safety.

### 5.2 STEP 2: REMOVING THE SAMPLE BAG

1. Gently open the lid of the test device.
2. Carefully take out the sample bag.

### 5.3 STEP 3: OPENING THE BAG

1. To open the sample bag, unroll it.

**Caution: Do not twirl it back as the water inside might splash out.**

### 5.4 STEP 4: NEUTRALISING THE SAMPLE

1. Pour 10 mL of bleach into the sample bag (**fill it halfway between the 100 mL and 4 oz line**). You can use any standard household grade bleach.
2. After adding bleach, seal the bag by holding the white wire tabs on the sides and twirl the bag at least **three times**.
3. Let the sample sit undisturbed for at least **30 minutes**. This will inactivate any contaminants present.

### 5.5 STEP 5: DISPOSAL

1. After ensuring the sample is neutralised, discard the sample into a wastewater drain (such as a toilet) and the sample bag into general waste.

**Note: Always ensure to handle contaminated samples with care, adhering to safety protocols.**

## 6 TROUBLESHOOTING

When encountering issues with the device, error messages might display on the screen. Below is a list of common error messages and the recommended solutions:

### 6.1 TEST SAMPLE IS NOT MIXED

*Solution:*

1. Remove the sample bag from the device.
2. Shake the bag vigorously until the contents are fully dissolved.
3. Re-insert the sample bag into the device.
4. Follow the instructions on the screen.
5. Close the lid securely.

### 6.2 DISPLAY IS WHITE

*Solution:*

1. Turn off power using the power switch and wait **10 seconds**. Turn the power switch back on.
2. If the problem persists, contact Bactosure's support team at [bactosure.com/support](https://bactosure.com/support) or via email at [support@bactosure.com](mailto:support@bactosure.com).

### 6.3 DISPLAY IS BLACK

*Solution:*

1. Check that the power adapter is plugged into the device and turn on the power switch.
2. Turn off power using the power switch and wait **10 seconds**. Turn the power switch back on.
3. If the problem persists, contact Bactosure's support team at [bactosure.com/support](https://bactosure.com/support) or via email at [support@bactosure.com](mailto:support@bactosure.com).

### 6.4 DISPLAY FREEZES OR DOES NOT RESPOND TO TOUCH INPUT

*Solution:*

1. Turn off power using the power switch and wait **10 seconds**. Turn the power switch back on.
2. If the problem persists, contact Bactosure's support team at [bactosure.com/support](https://bactosure.com/support) or via email at [support@bactosure.com](mailto:support@bactosure.com).

### 6.5 DISPLAY SHOWS A "CRITICAL HARDWARE" ERROR MESSAGE

*Solution:*

1. Turn off power using the power switch and wait **10 seconds**. Turn the power switch back on.
2. If the problem persists, contact Bactosure's support team at [bactosure.com/support](https://bactosure.com/support) or via email at [support@bactosure.com](mailto:support@bactosure.com).

### 6.6 INSUFFICIENT BATTERY

*Solution:*

1. Plug the power adapter into the device to charge the battery. You can complete tests while the device is charging.

## 6.7 IF THE BATTERY IS NOT CHARGING

### *Solution:*

1. Ensure the power cable is inserted properly into the device and that the power adapter has power.
2. If the problem persists, contact Bactosure's support team at **bactosure.com/support** or via email at **support@bactosure.com**.

## 6.8 THE TEST PROGRAM WILL NOT START

### *Solution:*

1. Check that the power cable is inserted in the device and that the mains power is switched on.

## 6.9 NO OR POOR INTERNET CONNECTION

### *Solution:*

1. Move the device closer to a **WiFi** access point and connect to it using the **Settings** menu.
2. If the problem persists, turn off the device, wait 10 seconds and turn it back on.

***Note: In the event of no internet connection, provisional test results will be provided on the display but a formal accredited report will not be issued until test results have been successfully sent to Bactosure from the device over WiFi.***

## 6.10 TEMPERATURE TOO LOW

### *Solution:*

1. Relocate the device to an environment **above 2°C** (but **below 30°C**)
2. Allow the device to adjust to the optimal temperature.

## 6.11 TEMPERATURE TOO HIGH

### *Solution:*

1. Move the device to a location with temperatures **below 30°C** (but **above 2°C**)
2. Let the device sit undisturbed until it returns to a normal operating temperature.

## 6.12 TEST SAMPLE REMOVED

### *Solution:*

1. The sample is unable to be tested if it is removed and re-inserted in the device.
2. Dispose of the old sample and collect a new sample.
3. Insert and run the test again with the new sample collected.

## 7 PRECAUTIONS

### 7.1 READ THE OPERATING MANUAL FIRST

Always read the operating manual thoroughly before operating the testing device. Familiarise yourself with all controls and functions.

### 7.2 REGULATORY COMPLIANCE NOTICE

Changes or modifications to this equipment not expressly approved by Bactosure, the party responsible for compliance, could void the user's authority to operate the equipment. This includes alterations to the device's hardware, software, or any of its components.

Always consult Bactosure's support team or refer to this operating manual for approved guidelines on using the equipment.

### 7.3 BATTERY SAFETY COMPLIANCE STATEMENT

This product contains a lithium-ion battery that complies with the International Standard IEC 62133 for battery safety. To ensure continued safety and compliance with this standard, users are advised to follow these guidelines:

1. **Charging:** Only use the charger provided with this device or other chargers approved by Bactosure to charge the batteries.
2. **Replacement:** Battery replacement should be done using only the specified and approved battery model. Contact our customer service for a replacement battery.
3. **Handling:** Avoid exposing the battery to high temperature, direct sunlight, or fire. Do not puncture, modify, or apply pressure to the battery.
4. **Disposal:** Dispose of used batteries according to local regulations or return them to an approved recycling or disposal facility.

***Failure to comply with these instructions may lead to a reduction in battery life, operational failure, or pose a safety hazard. Compliance with these guidelines will ensure the safe and optimal performance of your device under the terms of IEC 62133.***

### 7.4 AIR TRAVEL AND TRANSPORT GUIDELINES

When travelling with the Bactosure Duo or Bactosure Pro device on a commercial aircraft, the following guidelines must be observed:

- **Carry-on Only:** The device contains a lithium-ion battery and **must be carried in your carry-on luggage**. Do not place the device in checked baggage under any circumstances.
- **Battery Information:**
  - **Bactosure Duo:** 33.3 Wh
  - **Bactosure Pro:** 99.9 Wh
- These capacities are within most airline and IATA guidelines for lithium-ion batteries in portable electronic devices. If required, declare the device to airline staff at check-in or security.
- **Flight Mode Requirement:** Your device includes a wireless communication module (Wi-Fi, Bluetooth, and possibly cellular), it must be **switched off or placed in flight mode** for the duration of the flight, unless explicitly permitted by the airline.

Failure to follow these guidelines may breach airline safety policies and pose a risk to air travel safety.

## 7.5 STORAGE

- Store the device in a clean, cool, dry place and away from direct sunlight.
- Store all reagents according to the instructions on the reagent packaging.

## 7.6 PLACEMENT

- Ensure that the testing device is placed on a flat, stable surface.
- Avoid direct sunlight or places with rapid temperature changes.
- Ensure adequate air circulation around the device. Do not place it against walls or close to other large equipment.

## 7.7 POWER SOURCE

- Disconnect the power source when the testing device is not in use, or during maintenance/cleaning.

## 7.8 TEMPERATURE CONTROL

- Avoid opening the testing device lid, as this can lead to temperature fluctuations.

## 7.9 HYGIENE AND CLEANING

- Regularly clean the testing device to prevent microbial contamination.
- Use only alcohol to clean the device. Avoid using bleach, harsh chemicals or abrasive pads.
- Ensure the testing device is unplugged and cooled before cleaning.

## 7.10 HANDLING AND TRANSPORT

- Handle the testing device with care. Avoid dropping or jarring.
- If transporting, use the supplied box and ensure the testing device is secured to prevent movement and potential damage.

## 7.11 ICE POINT CHECK

An ice point check verifies the accuracy of the device's internal temperature sensors. This check is essential to ensure reliable water testing results. The device will prompt you to perform this check every six months.

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### 7.11.1 PURPOSE OF THE ICE POINT CHECK

The ice point check confirms that the Bactosure device's temperature sensor reads approximately 0°C. Accurate temperature readings are crucial for the device's functionality, as temperature variations can affect test outcomes.

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### 7.11.2 PERFORMING AN ICE POINT CHECK ON THE BACTOSURE DEVICE

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#### 1. INITIATE THE ICE POINT CHECK:

- Follow the on-screen instructions to start the ice point check process.

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## 2. PREPARE THE ICE WATER MIXTURE:

- Fill all of the device's testing chambers with crushed ice. Ideally, use crushed ice made from distilled water. Commercially available 'food-grade' ice will suffice if ice from distilled water is not available.
- Add cold water to the chamber, ensuring the ice is fully submerged but not floating.
- Stir the mixture to achieve a uniform temperature of 0°C.

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## 3. MONITOR THE READING:

- Allow the device to stabilise and display the temperature reading. You may need to stir the ice-water mixture to create more uniform temperature if the temperature gets close to 0°C then starts to rise.
- The device should read approximately 0°C within 5 minutes if the sensor is correctly calibrated.

If the reading is not approximately 0°C, the device will be locked and no further testing can occur. Contact Bactosure support for guidance on further troubleshooting or replacing the device.

### 7.12 MAINTENANCE AND REPAIR

- Do not attempt to repair the testing device yourself unless you are trained to do so.
- If you suspect a malfunction, unplug the device and consult the manufacturer or a certified technician.
- Regularly inspect cords and connections for damage or wear.

### 7.13 USAGE

- Ensure that containers or samples placed inside the testing chamber are properly sealed to prevent spillage or contamination.

### 7.14 STORAGE

- Store in a cool, dry place when not in use.
- If storing for an extended period, clean and dry the testing device thoroughly to prevent mould or bacterial growth.
- Store all reagents according to the instructions on the reagent packaging.

### 7.15 SAFETY

- Keep the device and reagents out of reach of children.
- Wear appropriate personal protective equipment (e.g. gloves) when handling samples or cleaning the device.
- In case of any unusual sounds, odours, or smoke, turn off and unplug the testing device immediately. Consult the manual or manufacturer for guidance.

### 7.16 ENVIRONMENTAL CONCERNS

- Dispose of the testing device and its batteries and components in accordance with local regulations.
- Consider recycling or reusing components when possible.