Aquagenx

Safe water for anyone, anywhere, anytime

Compartment Bag Test: Instructions for Use

The Compartment Bag Test (CBT) is a drinking water test that detects and quantifies *E. coli* bacteria in a 100 mL sample, the recommended fecal indicator and sample volume by the World Health Organization and U.S. Environmental Protection Agency. Portable, simple and self-contained, the CBT lets anyone, anywhere determine if drinking water poses a health risk.

CBT Kit includes supplies for 10 tests:

10 CBT bags
10 100 mL sample bottles
10 *E. coli* chromogenic culture medium test buds
30 chlorine tablets
1 reusable seal clip

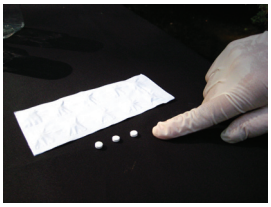
A video on how to use the CBT is on our website:
http://www.aquagenx.com/how-to-use-the-cbt/

Kit Components

Compartment Bag

Sample Bottle

E. coli Medium



Chlorine Tablets

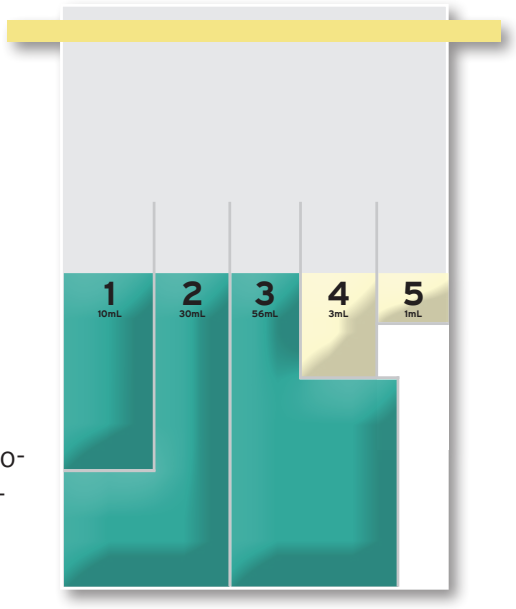
Seal Clip

Compartment Bag Volumes

The plastic bag has five compartments of different volumes, akin to five test tubes:

1 = 10 mL
2 = 30 mL
3 = 56 mL
4 = 3 mL
5 = 1 mL

Total = 100 mL



E coli medium contains a chromogenic substrate: 5-bromo-4-chloro-3-indolyl-beta-D-glucuronic acid (X-gluc)

How to Use

1. Prepare work area

- Sanitize your work area using a disinfectant cleaning solution and plastic gloves

2. Collect 100 mL water sample

- Fill sample bottle to 100 mL mark
- Avoid touching inside of bottle and lid
- Record details for your sample

3. Mix water sample with growth medium

- Open growth medium pouch and add medium bud to water sample
- Do not touch medium with fingers or hands
- Put lid on bottle and dissolve medium for about 15 minutes, periodically swirling to mix
- The medium dissolves from carrier. When medium is completely dissolved, the carrier turns white or nearly white.
- The carrier itself does not dissolve

4. Pour sample into compartment bag

- Tear off the perforated seam at top of bag
- Before filling bag, label it, then rub two sides together with your fingers to make it easier to open the bag and pour sample into it
- Use white tabs at top of bag to hold bag open while pouring
- Slowly pour sample into bag
- Leave test bud in the bottle while pouring
- Shift bag to adjust water volumes in all compartments to the fill mark
- Fill marks are indicated by horizontal lines toward top of the compartments
- Fill marks are the same in each compartment and water levels should be even across the bag

5. Seal bag

- Roll down bag to fill level, close bag with yellow Whirl-Pak seal
- Attach white plastic two-piece clip. U-shaped part of clip goes across width of bag just above water level along the fill line but below top openings of the compartments
- Snap rod-shaped part of the clip on the front of bag into the back of the clip on other side of bag to lock it in place

Tip #1 Testing should begin within six hours of sample collection. Samples can be held for as long as four days if they are kept below 10 °C (but not frozen).

Tip #2 Only the medium dissolves, not its carrier. The carrier just turns white or nearly white.

Dissolved medium indicated by carrier turning white.

Tip #3 Before filling the bag, label it, then rub the two sides with your thumb and fingers to help separate them so you can fill the compartments completely and evenly.

Fill marks are small horizontal lines.

Tip #4 Use the white two-piece clip to seal multiple bags together at the same time. Reuse clips.

6. Incubate

- Incubate the sealed compartment bag for bacterial growth
- Incubating at ambient temperature is fine for temperatures of 25°C and above. For temperatures below 25°C, use an insulated container or portable incubator.

Incubation Time and Temperature Recommendations:

35-44.5°C: incubate 20-24 hours
30-35°C: incubate 24-30 hours
25-30°C: incubate 40-48 hours

Tip #5 Incubating CBTs develop an odor. We recommend placing CBTs in another sealed plastic bag or insulated container during incubation period.

7. Score and record test results

- Yellow/yellow-brown indicates negative (absence) of *E. coli*, Blue/blue-green indicates positive (presence) of *E. coli*
- Concentration of fecal bacteria in the sample is estimated from the combination of positive and negative compartments, giving a Most Probable Number (MPN) estimate of *E. coli* per 100 mL
- Use MPN Table on next page to determine *E. coli* concentration
- Record MPN result

Yellow/Yellow-Brown = Absence of *E. Coli*
Blue/Blue-Green = Presence of *E. coli*

8. Decontaminate

- Open bag and add 3 chlorine tablets to top of bag. Agitate bag until chlorine tablets dissolve. Let bag stand for 45 minutes.
- After 45 minutes, pour liquid contents into a sink, toilet or hole in the ground and safely dispose of the empty bag
- Retain white plastic clip for reuse

Health Risk Based on World Health Organization Guidelines for Drinking Water Quality, 2011

Health Risk Category	*E. coli* CFU* per 100 mL
Safe	<1
Intermediate Risk/Probably Safe	1-10
High Risk/Probably Unsafe	>10-100
Very High Risk/Unsafe	>100

***MPN and CFU (colony forming units)** are equivalent terms, but MPN is obtained in quantal tests such as the CBT and CFU is obtained in colony-based tests such as membrane filtration.

Most Probable Number Table

The MPN Table represents World Health Organization "Guidelines for Drinking Water Quality," 4th Edition. Table 5.4 in the Guidelines has risk categories of drinking water based on *E. coli* levels as ranges: 0/100 mL = Safe; 1-10/100 mL = Intermediate Risk; 11-100/100 mL = High Risk; and >100/100 ml = Very High Risk.

The general consensus is drinking water should contain no *E. coli*, but in some countries *E. coli* numbers of up to 10/100 mL may be tolerated as being of intermediate risk.

Match your compartment bag volumes to one of these 32 possible outcomes:

Compartment #					MPN/100mL	Upper 95% Confidence Interval/100mL	Health Risk Category Based on MPN and Confidence Interval
1	2	3	4	5			
10mL	30mL	56mL	3mL	1mL			
					0.0	2.87	Low Risk/Safe
					1.0	5.14	Intermediate Risk/ Probably Safe
					1.0	4.74	
					1.1	5.16	
					1.2	5.64	
					1.5	7.81	
					2.0	6.32	
					2.1	6.85	
					2.1	6.64	
					2.4	7.81	
					2.4	8.12	
					2.6	8.51	
					3.2	8.38	
					3.7	9.70	
					3.1	11.36	Intermediate Risk/ Possibly Safe
					3.2	11.82	
					3.4	12.53	
					3.9	10.43	
					4.0	10.94	
					4.7	22.75	
					5.2	14.73	
					5.4	12.93	
					5.6	17.14	
					5.8	16.87	
					8.4	21.19	
					9.1	37.04	
					9.6	37.68	
					13.6	83.06	High Risk/Possibly Unsafe
					17.1	56.35	
					32.6	145.55	High Risk/Probably Unsafe
					48.3	351.91	
					>100	9435.10	Unsafe