



Aquagenx Compartment Bag Test (CBT)

CBT H₂S Kit

Instructions for Use: Drinking Water

Overview

The Aquagenx CBT H₂S Kit detects and quantifies the Most Probable Number (MPN) of hydrogen sulfide producing bacteria in a 100 mL sample. The MPN level of hydrogen sulfide bacteria in the sample is estimated by the combination of positive and negative compartments in the Aquagenx compartment bag. Test results are obtained by easy color match using the Aquagenx color-coded MPN Table.

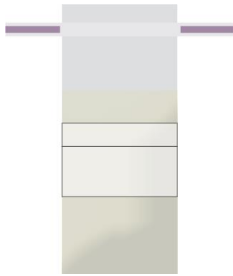

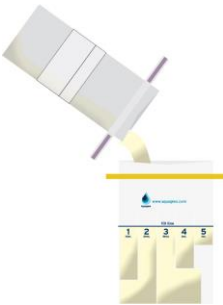
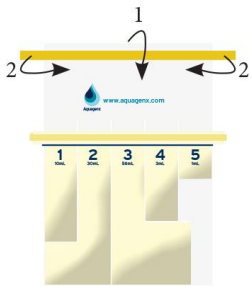
Shelf Life

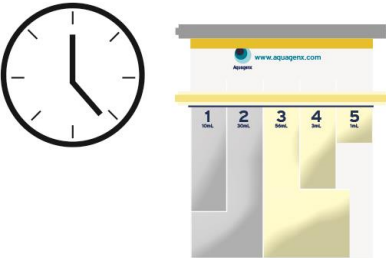
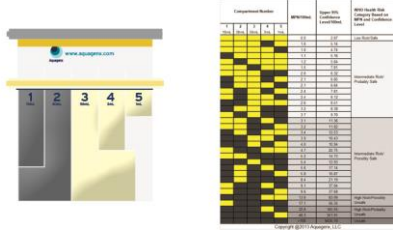
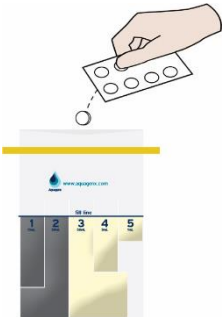
H₂S growth medium is stable up to 3-years after date of manufacture

Storage

Cold chain for H₂S growth medium not required. Recommended storage at 10°-25° Celsius. Protect growth medium from moisture, heat and bright light.

How to Use Aquagenx CBT H₂S Kit

			
Collect sample	Add growth medium powder	Pour sample into compartment bag	Attach plastic clip and roll down Whirl-Pak seal

		
Incubate 24-48 hours	Score MPN test results	Decontaminate sample



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Aquagenx CBT Most Probable Number (MPN) Table

The Aquagenx MPN Table is based on World Health Organization (WHO) "Guidelines for Drinking Water Quality," 4th Edition. MPN of H₂S per 100 mL is estimated from the combination of positive and negative compartments in the bag. Yellow/golden brown indicates negative (absence) for H₂S. Black/gray indicates positive (presence) for H₂S.

Align your compartment bag so compartment #1 is on the left and compartment #5 is on the right. Match the color sequence of your five compartments to one of these 32 rows:



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

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WHO Guidelines for Drinking Water Quality, Table 5.4, 4th Edition, 2011

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

Procedural Notes

Sample images of CBT H₂S Kit test results are on the Aquagenx website:

<https://www.aquagenx.com/sample-h2s-kit-test-results/>

1. Prepare work area

- Sanitize work area with disinfectant cleaning solution, paper towels or wipes

2. Collect 100 mL water sample with Thio Bag

- White tablet in Thio Bag is sodium thiosulfate, which neutralizes residual chlorine in sample. Do not remove.
- Wearing disposable, thin plastic gloves is recommended. If you don't have gloves, avoid touching inside of Thio Bag with bare hands.
- Limit the collection of debris/particles in Thio Bag as water sample is collected to avoid confusing debris/particles with potential positive black/gray results for H₂S
- Fill Thio Bag to 100 mL fill mark. Record sample details.

3. Add H₂S growth medium to sample

- Open growth medium powder pillow and pour entire contents into sample
- Do not touch powder with bare fingers or hands
- Dissolve medium in sample for 10-12 minutes
- Powder medium is dissolved when you cannot see any white powder in sample. Sample liquid may turn pale yellow color.

4. Pour sample into compartment bag

- Label bag or attach barcode asset tag to compartment bag
- Tear off perforated seam at top of bag
- Rub top and sides of bag together in each compartment to open so water easily runs into compartments
- Use white tabs at top of bag to pull open
- Slowly pour sample into bag while gently tilting and squeezing bag to distribute sample amongst five compartments
- Fill evenly to the top of the fill line



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5. Seal compartment bag shut

- Attach seal clip across the bag above the fill line and below the compartment top openings. Place U-shape across width of the bag above liquid level along the fill line but below compartment openings. Snap rod-shaped part of the clip from other side of bag into U-shape to lock in place.
- Close the top of the bag with the yellow Whirl-Pak seal and then roll down the bag toward the seal clip.

6. Incubation Period

- During the incubation period, CBTs can develop an odor. Place CBTs in another sealed plastic bag or container during the incubation period.
- Ambient temperature incubation works at 25°- 37°C
- The CBT works at variable temperatures. Constant temperature control in an incubator is not required but is recommended in cooler temperatures if available.
- Below 25°C, use a portable incubator or find a warm location at or above 25°C for incubation

Incubation Period Time and Temperature Recommendations:

35-37°C: Incubate 20-24 hours. If no color change, incubate another 24 hours to confirm negative result.

31-34°C: Incubate 24-30 hours. If no color change, incubate another 24 hours to confirm negative result.

25-30°C: Incubate 40-48 hours. If no color change, incubate another 24 hours to confirm negative result.

Below 25°C: Incubate in a portable incubator 35-37°C for 24 hours, or put in or near another heat source for up to 48 hours depending on the temperature

7. Score and record test results

- Align compartments in correct sequence to Aquagenx MPN Table, hold bag up to read results
- Black (positive) presence of H₂S can look fuzzy in compartments. Dirt particles and debris in sample will have sharper edges and look like specs. If only dark particles or debris are found in a compartment, the compartment is negative for H₂S.
- Yellow/golden brown indicates negative (absence) in compartment for H₂S
- Black/gray indicates positive (presence) in compartment for H₂S
- Match color sequence of five compartments to one of 32 rows in MPN Table to obtain MPN test results.
Record test results

8. Decontaminate sample

- Users can source and add 1-2 mL of liquid bleach (NaOCl) or sufficient free chlorine tablets (calcium hypochlorite or sodium dichloroisocyanurate) to provide about 100 milligrams of free chlorine.
- After 45 minutes, pour contents into a sink, toilet or hole in ground and safely dispose the empty compartment bag
- Retain seal clip for reuse

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