



**To identify Heterotrophic Aerobic Bacteria (HAB)
Used in oil, gas and petrochemical industries, aviation,
food, water and waste water and other industries.**

A group of bacteria that use organic materials as a source of energy and carbon for their needs is called heterotrophic bacteria. Heterotrophic Aerobic Bacteria (HAB) are a diverse group of heterotrophic bacteria that are able to grow in oxygenated medium. These bacteria are either obligate aerobic or fall into the category of facultative anaerobic microorganisms. Aerobic heterotrophic bacteria play a major role in biodegradation and their presence in oxygen-rich waters has a vital effect on the optimal efficiency of structures and engineering operations in various industries. Therefore, the MicrobCheck™ AERO test kit was designed in response to the needs of water and wastewater laboratories to check the presence/absence of HAB bacteria without the need to identify a specific group of bacteria.

The unique feature of MicrobCheck™ AERO test kit is methylene blue color. This color acts as an indicator for respiratory activity. In fact, as long as free oxygen is available for HAB bacteria in the culture medium, methylene blue color remains unchanged. As soon as all the oxygen is consumed by bacterial respiration, methylene blue changes to a colorless form, which is caused by the activation of the methylene blue reductase enzyme in bacteria and the reduction of methylene blue color. The color change can occur from bottom to top or from top to bottom in test falcon. Sometimes bacteria start collecting and integrating this dye before starting to use methylene blue, as a result of which, the culture medium is seen in a darker blue color.

MicrobCheck™ AERO test kit is designed as a 50 ml falcon containing culture medium and floating ball.

Manufacturer's Recommendation

Avoid contact with the inner wall of the Falcon. Perform the test under sterile conditions.

After opening the falcon door, place the door upside down on a clean surface.

Do not shake or rotate the falcon after the sample is added. Let the ball float on the surface of the liquid.

In some cases, heterotrophic aerobic bacteria accumulate in places far from reach. Get the sample from the right place.

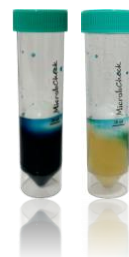
Test Method

Preparation Incubation

Collect at least 25 ml of sample.

Pour 19 ml of the sample into the test falcon and close it.

Write down the date and sample name on the kit label and stick it on the falcon.



Incubation

incubate the falcon in an incubator with a temperature of 37 °C or at room temperature (21 - 25 °C) and away from sunlight. Check the sample daily for 4 days. Note the date of the first observed reaction.

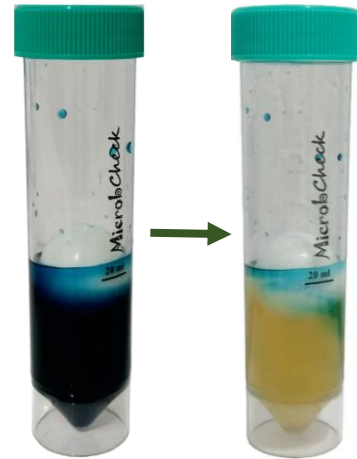
Presence/Absence and Interpretation of Observed Patterns in the Results

Presence / Absence: A positive MicrobCheck™ AERO test is indicated by the change of the color of the medium from blue to yellow.

UP Pattern: Bleaching from the bottom of the falcon to the ball or reaction 1. The Bleached area can be clear or with cloudy structures. If cloudy structures are formed, the medium will turn yellow. Rarely, the bleaching extends around the ball as well. Usually, a blue ring remains around the ball. In the UP model, obligate aerobic bacteria are dominant and a population of facultative anaerobic bacteria may also be present.

DO pattern: color change from the ball to the bottom or reaction 2. The bleached area is usually cloudy and seen in yellow color. The color change is more widespread around the ball than in the UP state, and the blue ring around the ball is less wide than in the previous pattern. In the DO pattern, facultative anaerobic heterotrophs are dominant and some anaerobic bacteria can also be present.

Note that usually in both patterns, the blue ring remains around the ball, but in the second pattern, the width of the ring is smaller.



Estimation of Population and Aggression Level

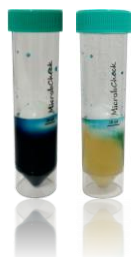
If the test result is positive, you can estimate the bacteria population and their aggression level according to the table below. A faster reaction occurs when the bacterial population is higher.

Observing a positive reaction on the first day indicates the very high aggressiveness of bacteria, and in this case, the operation against bacteria should be done as soon as possible.

Observing a positive reaction on the second day indicates the aggressiveness of the bacteria, and dealing with it should be considered in the near future.

If a reaction is observed on the third day, there is no urgent need to fight to eliminate the bacteria, but the bacterial population must be under regular control.

A positive reaction on the fourth day indicates the presence of background bacteria in the sample at a normal level. In this case, there is no urgent need for follow-up, but it is still better to consider appropriate controls.



| Aggression Level | Time Lag (day) | Population (cfu/ml) |
|-----------------------|----------------|---------------------|
| Very aggressive | 1 | 7,000,000 |
| Aggressive | 2 | 500,000 |
| Moderately Aggressive | 3 | 50,000 |
| Normal Background | 4 | 7000 |

More Reviews

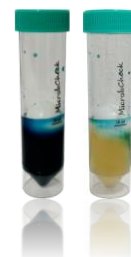
If the problem in the samples is caused by aerobic bacteria, the MicrobCheck™ AERO test can be used as the first test. More tests can be scheduled according to the table below. If there is a possibility of Hygiene Risk, it is necessary to test the presence/absence of *coliform* bacteria.

Suggested Tests

| Problem | IRB | SRB | Slime | FLOR | Algae |
|-----------------|-----|-----|-------|------|-------|
| White Slime | + | | + | | + |
| Grey Slime | + | | | | |
| Black slime | + | | | | |
| Brown Slime | + | | + | | + |
| Green Slime | + | | + | | + |
| Turbidity | | | + | | + |
| Change in Taste | + | | + | | + |
| Change in Odor | | + | + | + | + |
| Change in Color | + | + | | | + |
| Corrosion | | + | + | + | |
| Hygiene Risk | + | | + | + | |

Quality Control of MicrobCheck™ AERO Test Kit

To confirm the quality and performance of MicrobCheck™ AERO test kit, the specified strains can be cultured and reaction patterns can be checked. After adding the bacterial dilution, wait until the suspension enters the culture medium and avoid shaking the falcon. Store the kit at 37°C or room temperature and observe the reactions for at least 4 days.



| Organism (ATCC) | Pattern |
|---------------------------------------|---------|
| <i>Pseudomonas aeruginosa</i> (27853) | DO |
| <i>Escherichia coli</i> (25922) | UP |

Best Time to Use

The expiration date of the kits is 6 months and it is necessary to store them in the refrigerator (4-8 °C). It is recommended to avoid frequent temperature changes and storage in the freezer.

Disposal

Test kits are contaminated after use and bacteria growth. As a result, it is necessary to autoclave them or burn them in a furnace. If this is not possible, open the falcons under the laboratory hood and fill it with bleach liquid with a concentration of 5 to 10%. Let it sit overnight and then throw it away.

