

3M Food Safety

3M™ Petrifilm™ Aqua Heterotrophic Count Plate

3M™ Petrifilm™ Aqua Coliform Count Plate



Technician Productivity Maximized

Interpretation Guide

Introducing 3M™ Petrifilm™ Aqua Plates for Water Testing, offering four plates to cover your unique testing needs — Heterotrophic Count, Coliform Count, Enterobacteriaceae Count and Yeast & Mold Count. 3M Petrifilm Aqua Plates are ideal for testing bottled water.



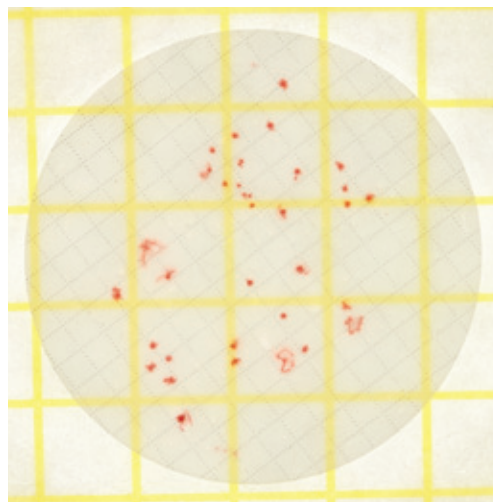
The 3M™ Petrifilm™ Aqua Plate system brings the convenience of 3M Petrifilm Plate technology to water testing¹. The 3M Petrifilm Aqua Plate's compact, easy-to-use format brings space savings and reduced waste to the laboratory. An independent, third party study² indicates 3M Petrifilm Aqua Plates do not perform statistically different from either SMEWW³ or ISO⁴ bottled water testing reference methods.

This guide familiarizes you with results on the 3M™ Petrifilm™ Aqua Heterotrophic Count Plate and 3M™ Petrifilm™ Aqua Coliform Count Plate. For more information, contact the official 3M Food Safety representative nearest you.

3M™ Petrifilm™ Aqua Heterotrophic Count Plate (AQHC)

The 3M Petrifilm Aqua Heterotrophic Count (AQHC) Plate is a sample-ready culture medium system which contains Standard Methods nutrients, a cold-water-soluble gelling agent, and a tetrazolium indicator that facilitates colony enumeration in the bottled water industry. Count all red colonies on 3M Petrifilm Aqua AQHC Plates regardless of size or color intensity.

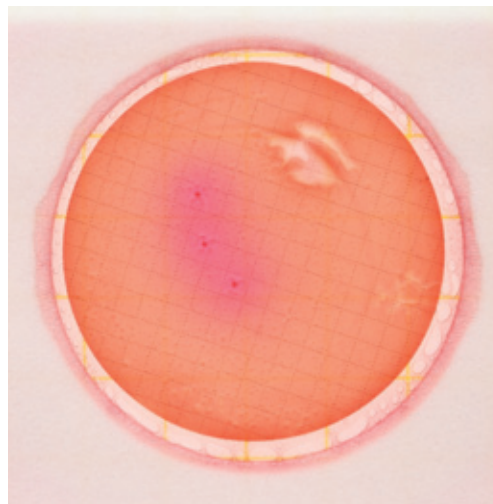
See Pages 3–5



3M™ Petrifilm™ Aqua Coliform Count Plate (AQCC)

The 3M Petrifilm Aqua AQCC Plate is a sample-ready culture medium system which contains Violet Red Bile (VRB) nutrients, a cold-water-soluble gelling agent, and a tetrazolium indicator that facilitates colony enumeration. 3M Petrifilm Aqua AQCC Plates are used for the enumeration of coliforms in the bottled water industry. On 3M Petrifilm Aqua AQCC Plates, coliform colonies are indicated by red colonies associated with gas.

See Pages 6–7



Low number of colonies with gas bubbles

¹ 3M has not documented the performance of 3M Petrifilm Aqua Plates for water samples other than bottled water. The use and validation of 3M Petrifilm Aqua Plates to test other types of water samples, such as process or rinse water, is at the sole discretion and responsibility of the end user.

² Q Laboratories, Inc., Cincinnati, OH, USA study comparing 3M Petrifilm Aqua Plate performance vs. reference methods. Study presented at 2011 International Association for Food Protection (IAFP).

³ Standard Methods for the Examination of Waste Water (SMEWW) 9215A6a and 9222E2b

⁴ SO 6222, ISO 9308-1

3M™ Petrifilm™ Aqua Heterotrophic Count Plate (AQHC)

Negative Plate and Plates with Colonies on Filters

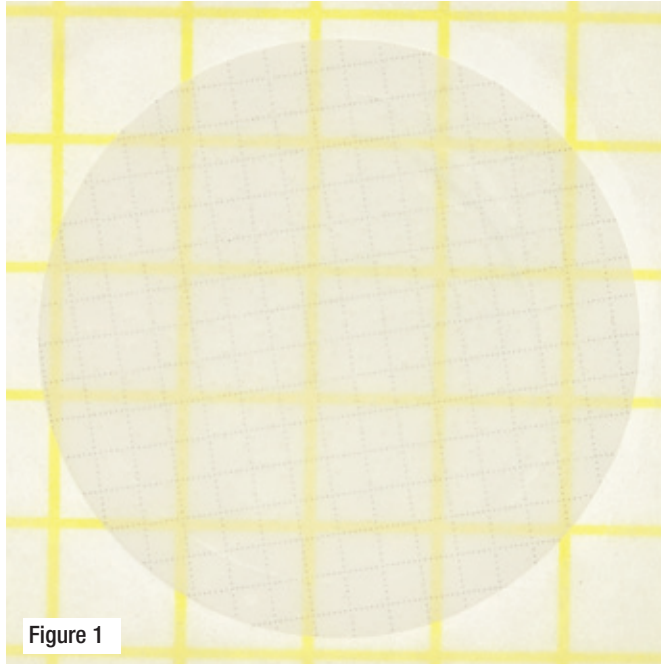


Figure 1

AQHC plate with filter
Count: 0

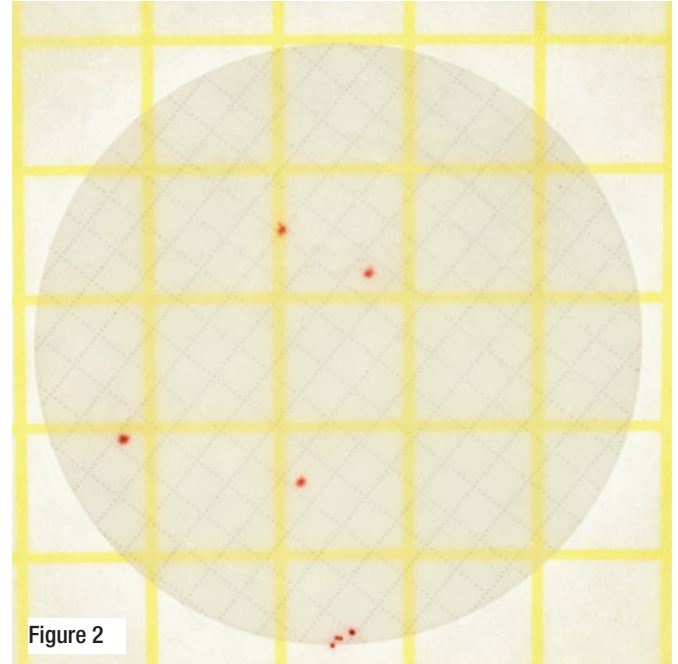


Figure 2

AQHC plate with low count on filter
Count: 8 cfu
Observation: Count all colonies regardless of their size or color intensity.

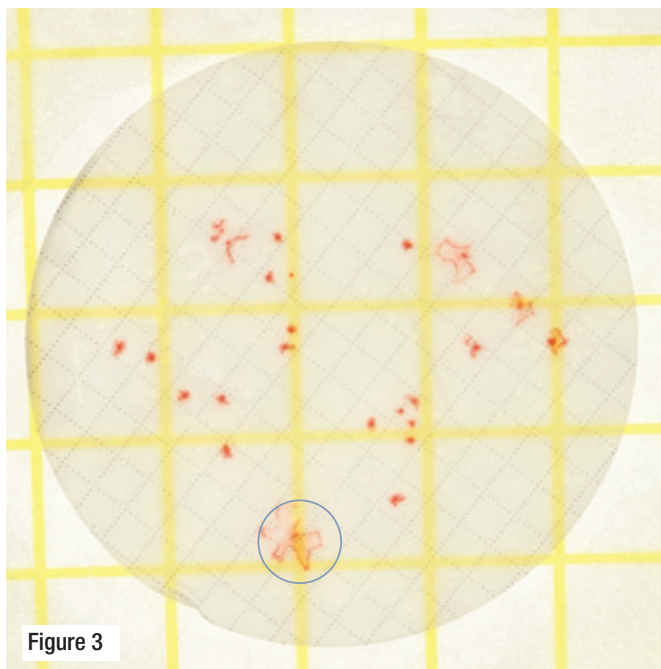


Figure 3

AQHC plate with high count on filter
Count: 24 cfu
Observation: Note colony morphology is altered by colony-associated gas production. See circle for example.

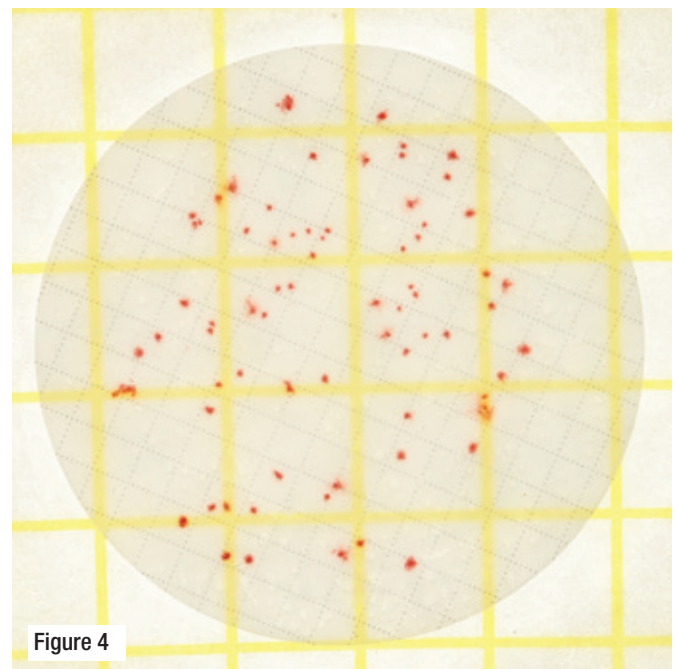
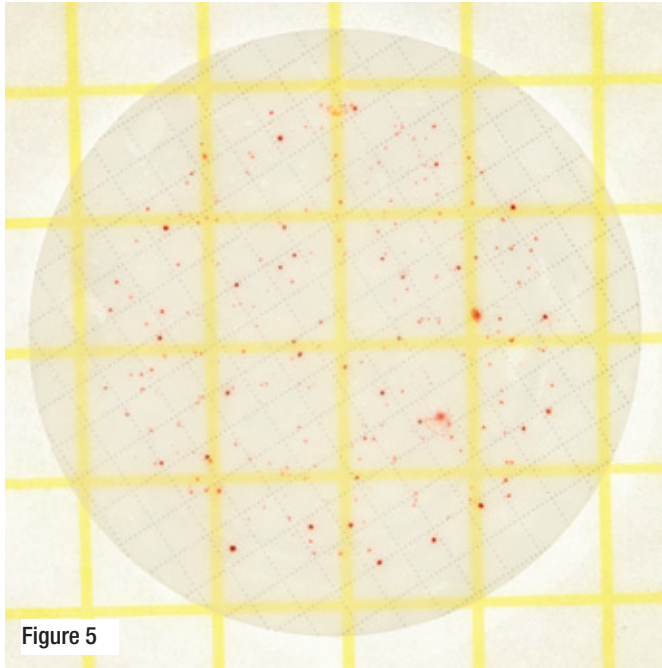


Figure 4

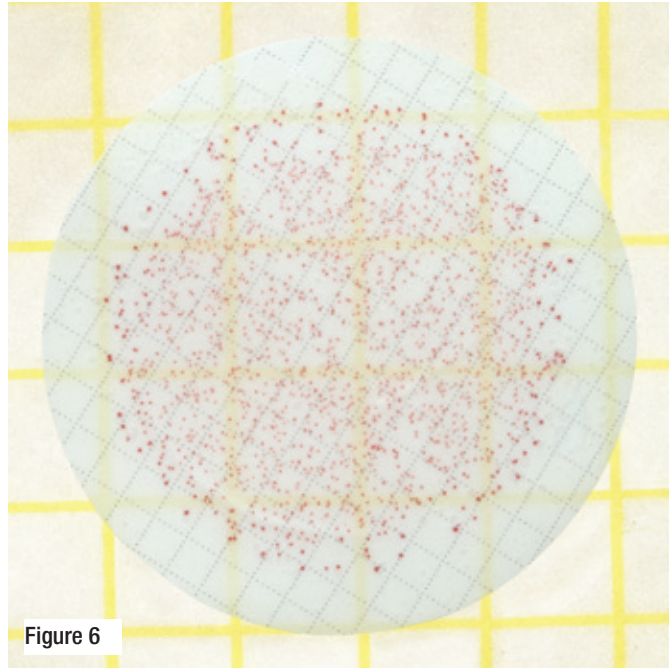
AQHC plate with high count on filter
Count: 71 cfu

3M™ Petrifilm™ Aqua Heterotrophic Count Plate (AQHC)

Plates with High Counts on Filters



AQHC plate with colonies too numerous to count on filter
Observation: Colonies vary in size and color intensity.



AQHC plate with colonies too numerous to count on filter

Negative Plate and Plates with Colonies — 1mL Direct Plate (No Filter)

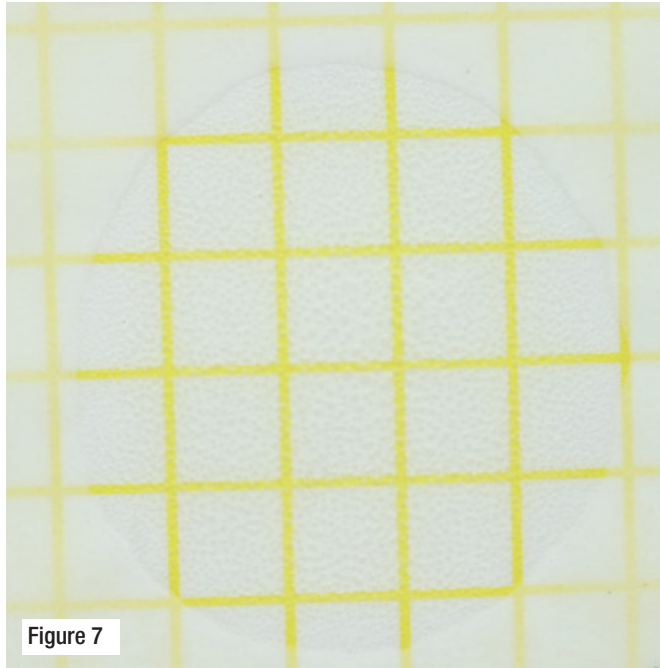


Figure 7

AQHC plate
Count: 0

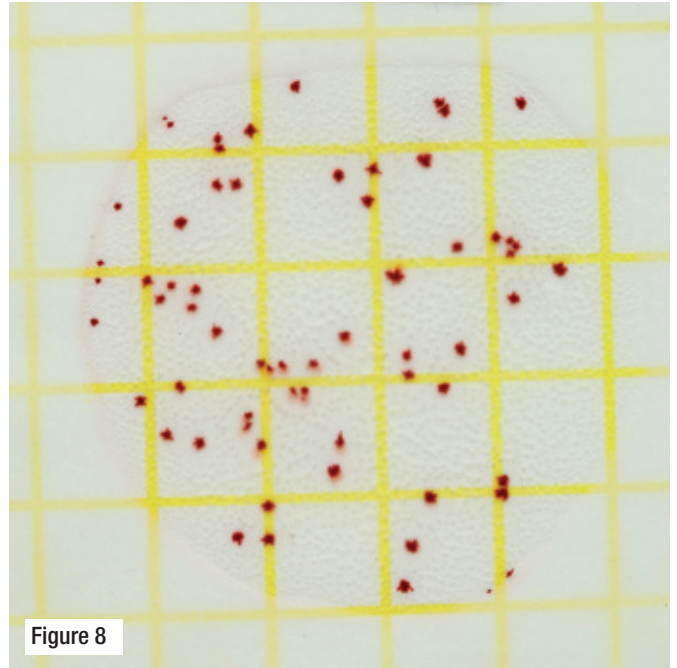


Figure 8

AQHC plate with high count
Count: 64 cfu
Observation: Count all colonies regardless of their size or color intensity.

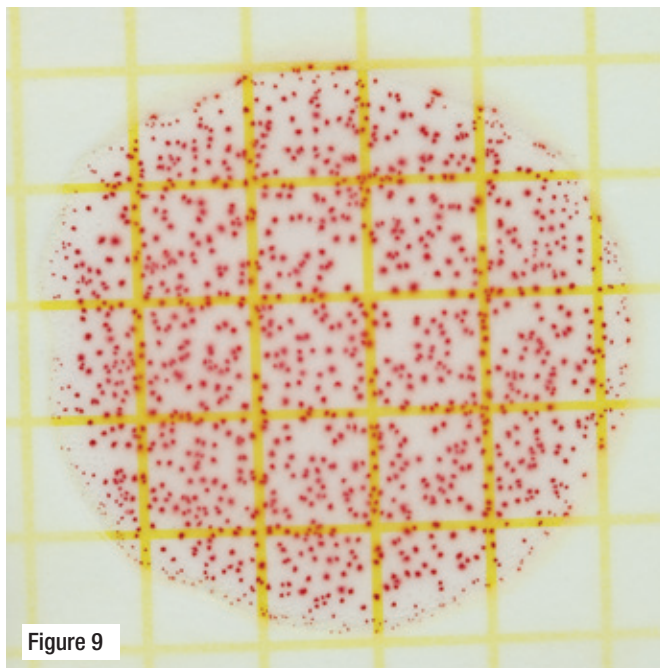


Figure 9

AQHC plate with colonies too numerous to count
Count: estimate 10^3 cfu
Observation: Determine the average number of colonies in one square (1cm²) and multiply it by 20 to estimate the total count per plate.

3M™ Petrifilm™ Aqua Coliform Count Plate (AQCC)

Negative Plate and Plates with Colonies on Filter

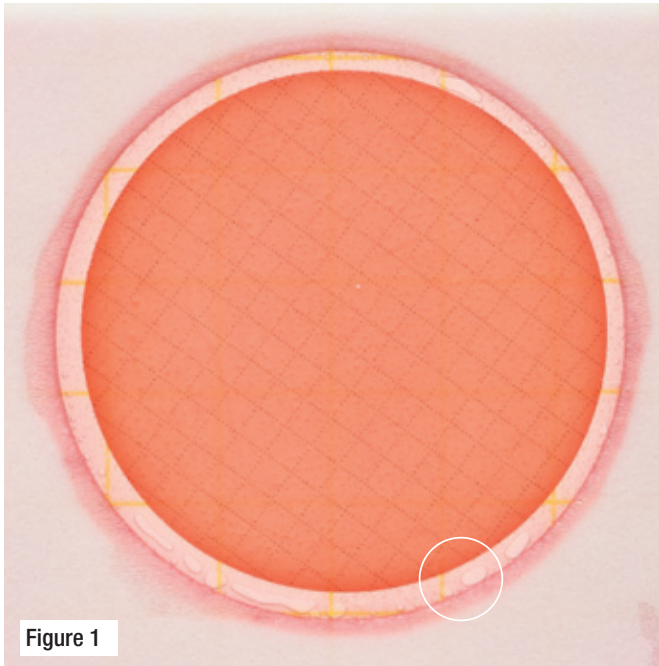


Figure 1

AQCC plate with filter

Count: 0

Observation: Gas bubbles surrounding filter do not indicate microbial growth. See circle for example.

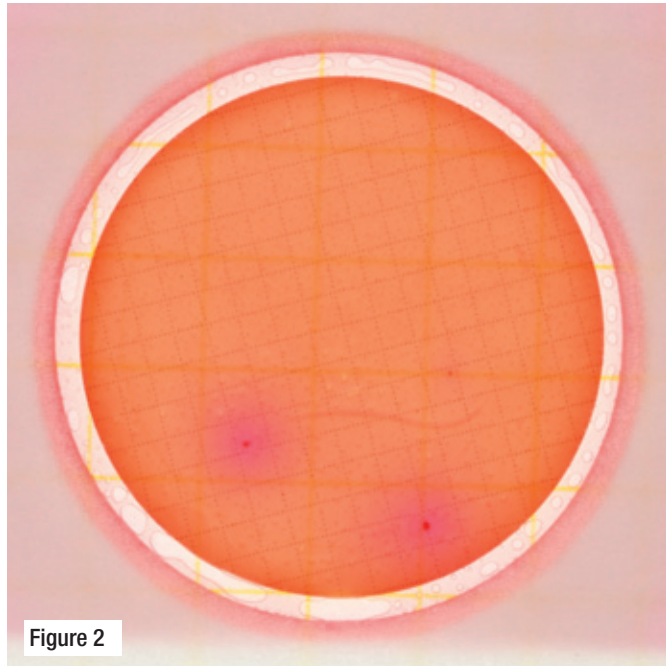


Figure 2

AQCC plate

Count: 0 cfu

Observation: Red colonies without closely associated gas bubbles may be coliforms and should be picked and tested with appropriate confirmation methods.

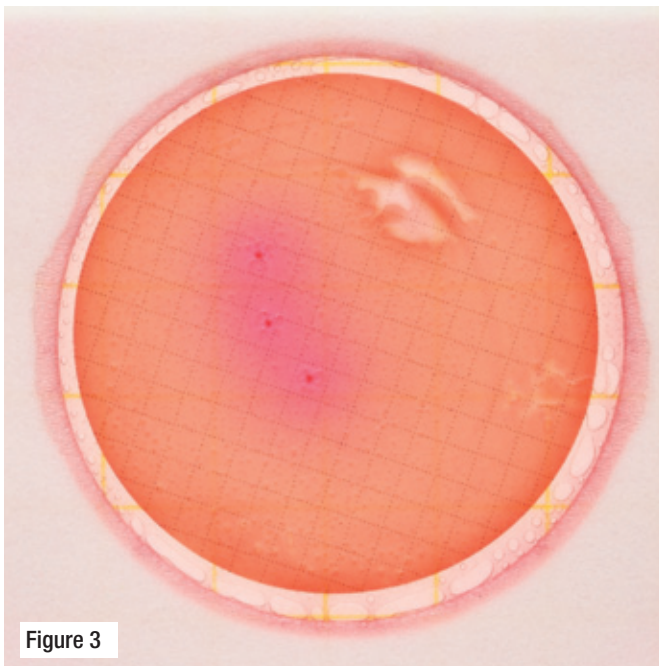


Figure 3

AQCC plate with low count on filter

Count: 3 cfu

Observation: Coliforms produce acid (faint pink halo associated with colonies) and are associated with gas bubbles.

Plates with High Counts on Filter

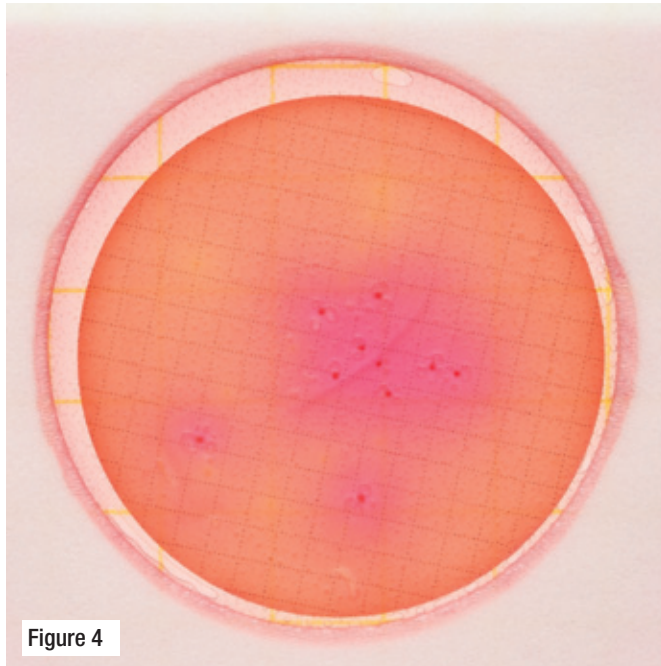


Figure 4

AQCC plate with high count on filter
Count: 10 cfu

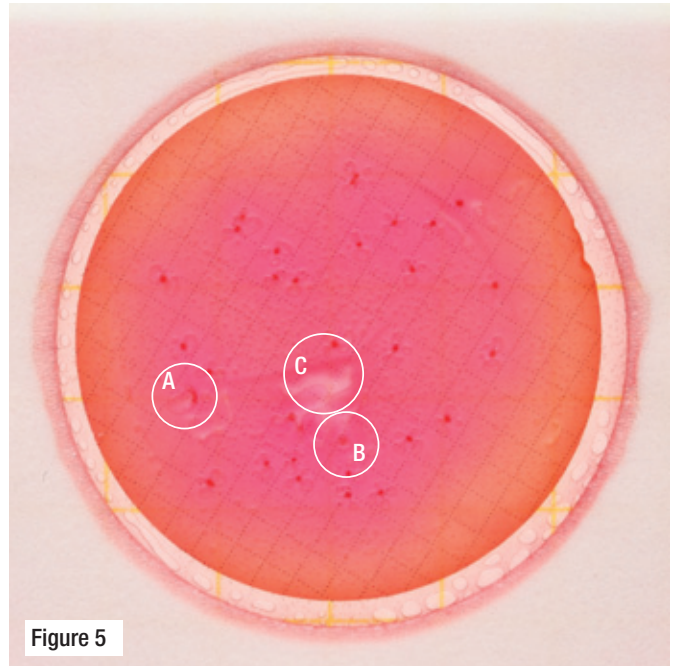
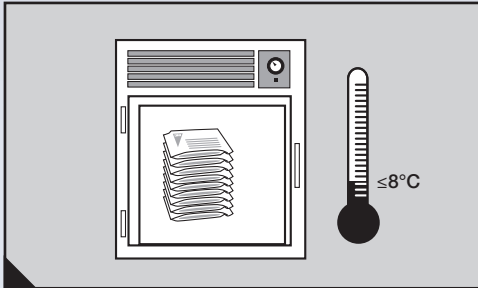


Figure 5

AQCC plate with high count on filter
Count: 30 cfu
Observation: Gas bubbles influence colony morphology:
Coliform distorted by gas bubble (circle 'A'); faint colony
underneath gas bubble (circle 'B'). Note large artifact gas
bubble in the center of the plate (circle 'C').

3M™ Petrifilm™ Aqua Heterotrophic Count Plate (AQHC)

Storage for Plates

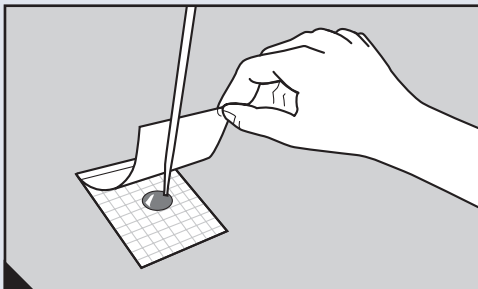


A Store unopened packages at $\leq 8^{\circ}\text{C}$ ($\leq 46^{\circ}\text{F}$). Use before expiration date on package. In areas of high humidity where condensate may be an issue, it is best to allow packages to reach room temperature before opening.

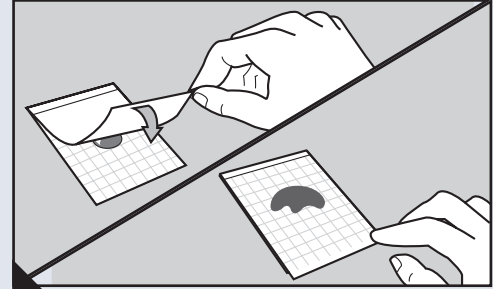


B To seal opened package, fold end over and tape shut. **Do not refrigerate opened packages.** Use 3M Petrifilm Aqua AQHC Plates within one month after opening.

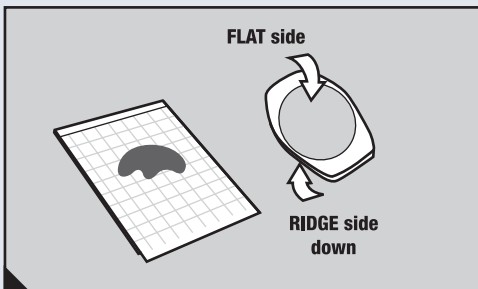
Inoculation or Hydration Procedure



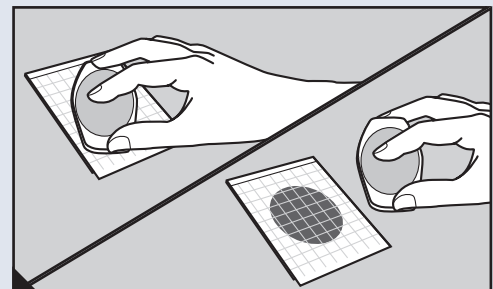
C Place 3M Petrifilm Aqua Plate on a **level surface**. With the pipette **perpendicular** to the 3M Petrifilm Aqua AQHC Plate, place 1 mL of sample OR hydration diluent onto the center of the bottom film.



D Carefully **roll** top film down so that it contacts the sample or hydration diluent and then drop the top film.



E With **ridge** side down, place spreader on top film over inoculum or hydration diluent.



F

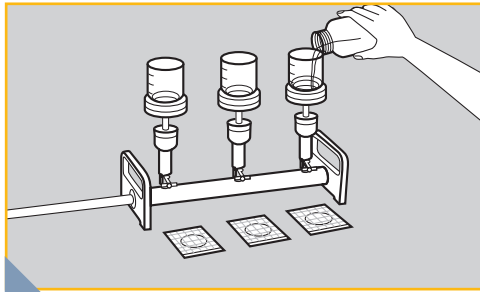
- **Gently** apply pressure on spreader to distribute inoculum or hydration diluent over circular area before gel is formed. Do not twist or slide spreader. Lift spreader.
- When **direct plating a sample**, wait a minimum of one minute for gel to solidify. Proceed to step 'J'.
 - When **inoculating with hydration diluent**, allow the hydrated plates to remain closed for a minimum of one hour before use. Proceed to step 'G'.
 - Any additional hydrated 3M Petrifilm Aqua AQHC Plates may be stored in a sealed pouch or plastic bag. Protect plates from light and refrigerate at $2-8^{\circ}\text{C}$ ($36-46^{\circ}\text{F}$) for up to 14 days.

IMPORTANT

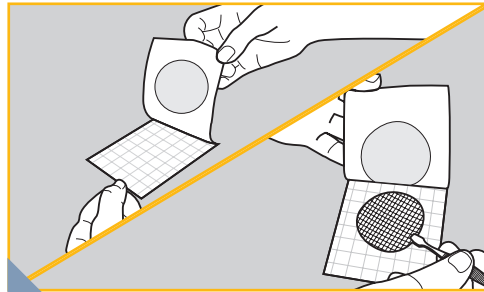
If you are direct plating, skip to step 'J'.

If you are using a 3M Petrifilm Aqua AQHC Plate with a filter, proceed to step 'G'.

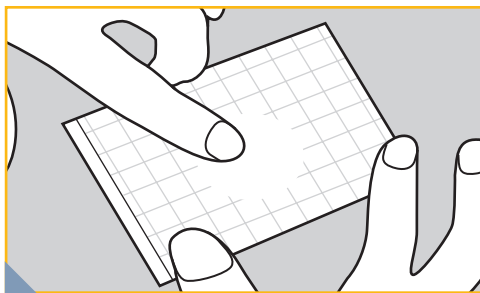
Inoculation Steps for Plates with Filters



G Following standard procedures for water analysis, membrane filter water sample using a 47mm, **0.45 micron pore size** Mixed Cellulose Ester (MCE) filter.

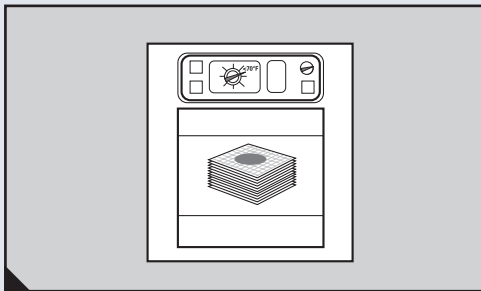


H Lift the top film. Place filter in the center of the hydration area, grid side up. Roll top film down to **minimize air bubbles** or gaps between the filter and the 3M Petrifilm Aqua AQHC Plate.



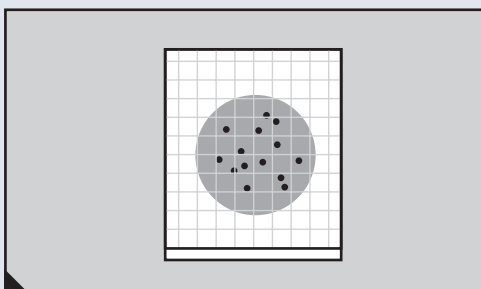
I Lightly apply pressure to ensure uniform contact of the filter with the gel and to eliminate any air bubbles.

Incubation

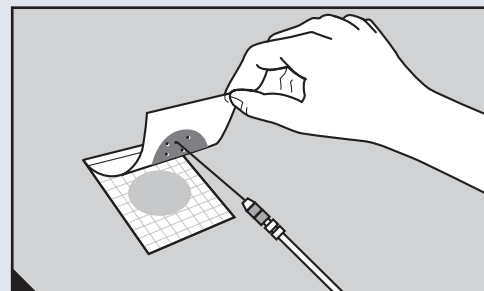


J Incubate 3M Petrifilm Aqua AQHC Plates in a horizontal position, clear side up, in stacks on no more than 20 plates:
Plate with Filter Procedure: $35^{\circ} \pm 2^{\circ}\text{C}$ for 48 ± 3 hours
Direct Plate Procedure: $22^{\circ} \pm 2^{\circ}\text{C}$ for 68 ± 4 hours or $36^{\circ} \pm 2^{\circ}\text{C}$ for 44 ± 4 hours

Interpretation



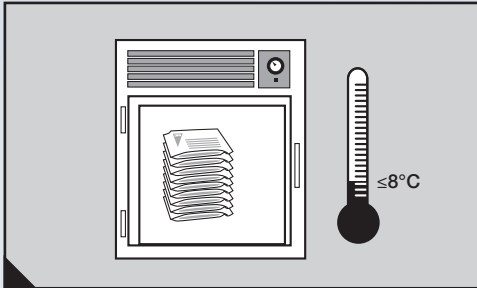
K 3M Petrifilm Aqua AQHC Plates can be counted on a standard colony counter or other illuminated magnifier. Refer to the *Interpretation Guide* section when reading results.



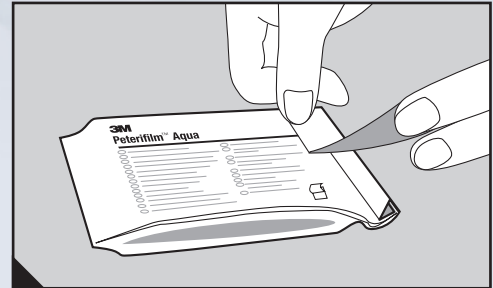
L Colonies may be isolated for further identification. Lift top film and pick the colony from the gel.

3M™ Petrifilm™ Aqua Coliform Count Plate (AQCC)

Storage for Plates

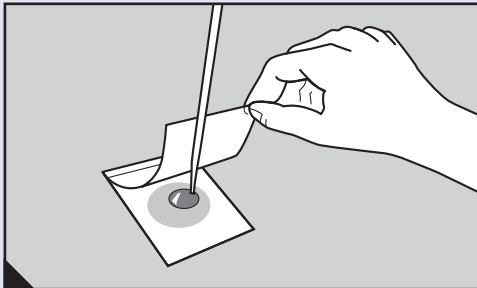


A Store unopened packages at $\leq 8^{\circ}\text{C}$ ($\leq 46^{\circ}\text{F}$). Use before expiration date on package. In areas of high humidity where condensate may be an issue, it is best to allow packages to reach room temperature before opening.

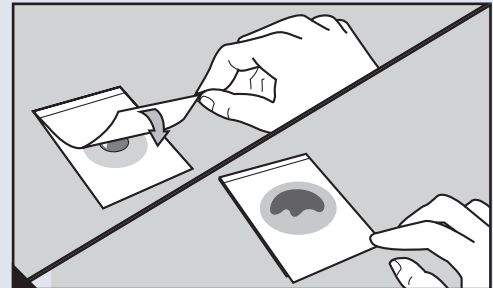


B To seal opened package, fold end over and tape shut. **Do not refrigerate opened packages.** Use 3M Petrifilm Aqua AQCC Plates within one month after opening.

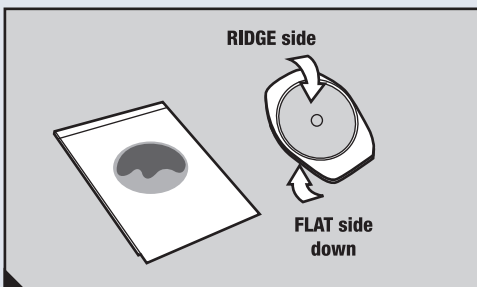
Hydration Procedure



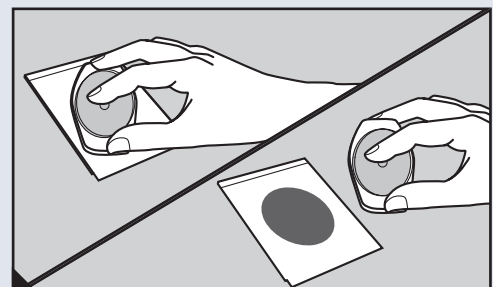
C Place 3M Petrifilm Aqua AQCC Plate on a **level surface**. With the pipette **perpendicular** to the 3M Petrifilm Aqua Plate, place hydration diluent onto the center of the bottom film.



D Carefully **roll** top film down to avoid entrapping air bubbles. **Do not let top film drop.**

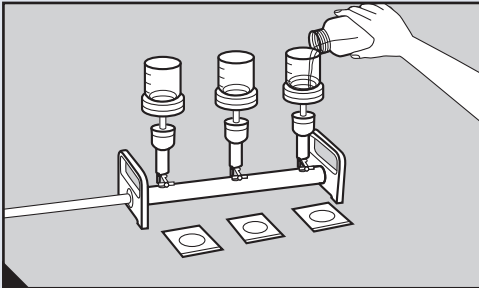


E With **flat** side down, place spreader on top film over hydration diluent.

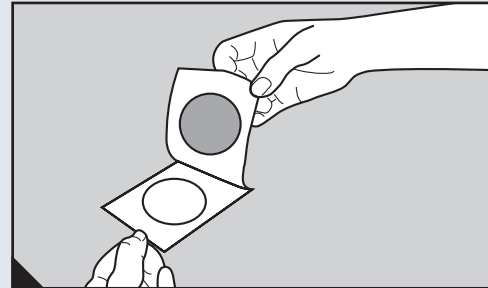


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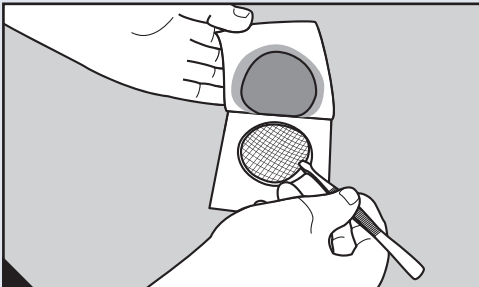
- Gently apply pressure on spreader to distribute inoculum or hydration diluent over circular area before gel is formed. Do not twist or slide spreader. Lift spreader.
- Allow the hydrated plates to remain closed for a minimum of one hour before use. Proceed to step 'G'.
- Any additional hydrated 3M Petrifilm Aqua AQCC Plates may be stored in a sealed pouch or plastic bag. Protect plates from light and refrigerate at $2-8^{\circ}\text{C}$ ($36-46^{\circ}\text{F}$) for up to 7 days.



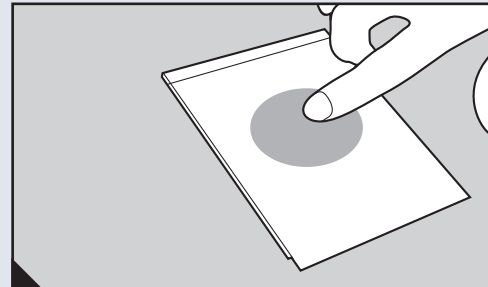
G Following standard procedures for water analysis, membrane filter water sample using a 47mm, **0.45 micron pore size** Mixed Cellulose Ester (MCE) filter.



H Lift top film.

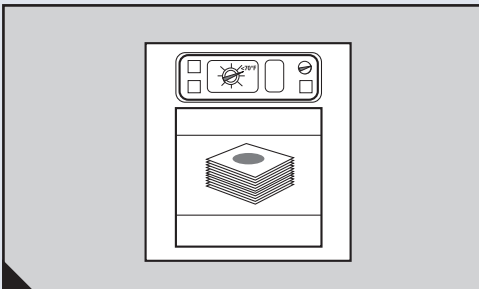


I Place filter in the center of the well. Roll top film down to **minimize air bubbles** or gaps between the filter and the 3M Petrifilm Aqua AQCC Plate.



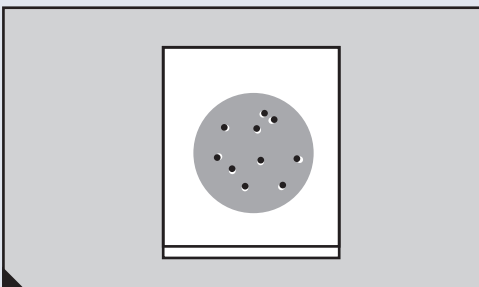
J Lightly apply pressure to ensure uniform contact of the filter with the gel and to eliminate any air bubbles.

Incubation

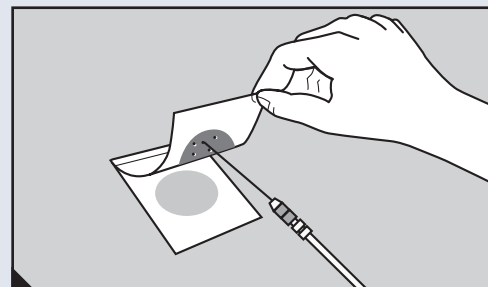


K Incubate 3M Petrifilm Aqua AQCC Plates in a horizontal position, clear side up, in stacks on no more than 20 plates at $35^{\circ}\pm 1^{\circ}\text{C}$ for 24 ± 2 hours or $36^{\circ}\pm 1^{\circ}\text{C}$ for 24 ± 2 hours.

Interpretation



L 3M Petrifilm Aqua AQCC Plates can be counted on a standard colony counter or other illuminated magnifier. Refer to the *Interpretation Guide* section when reading results.



M Colonies may be isolated for further identification. Lift top film and pick the colony from the gel.

3M Food Safety offers a full line of products to accomplish a variety of your microbial testing needs.
For more product information, visit us at www.3M.com/foodsafety.



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