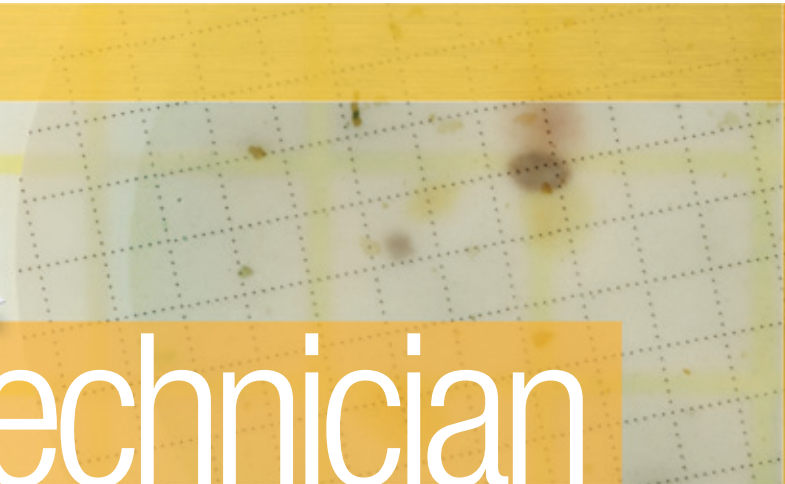


3M Food Safety

**3M™ Petrifilm™ Aqua Enterobacteriaceae Count Plate**

**3M™ Petrifilm™ Aqua Yeast and Mold 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.



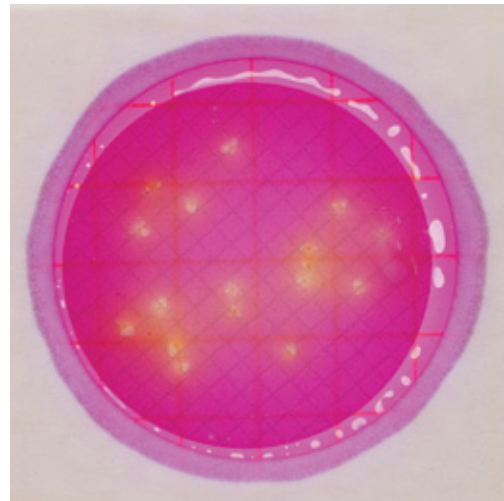
The 3M™ Petrifilm™ Aqua Plate system brings the convenience of 3M Petrifilm Plate technology to water testing<sup>1</sup>. The 3M Petrifilm Aqua Plate's compact, easy-to-use format brings space savings and reduced waste to the laboratory. An independent, third party study<sup>2</sup> indicates 3M Petrifilm Aqua Plates do not perform statistically different from either SMEWW<sup>3</sup> methods or commonly used bottled water testing methods<sup>4</sup>.

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

## 3M™ Petrifilm™ Aqua Enterobacteriaceae Count Plate (AQEB)

The 3M Petrifilm Aqua AQEB 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 AQEB Plates are used for the enumeration of Enterobacteriaceae in the bottled water industry. On the 3M Petrifilm Aqua AQEB Plate, Enterobacteriaceae will appear as red colonies with yellow zones, red colonies with gas bubbles, or red colonies with yellow zones and gas bubbles.

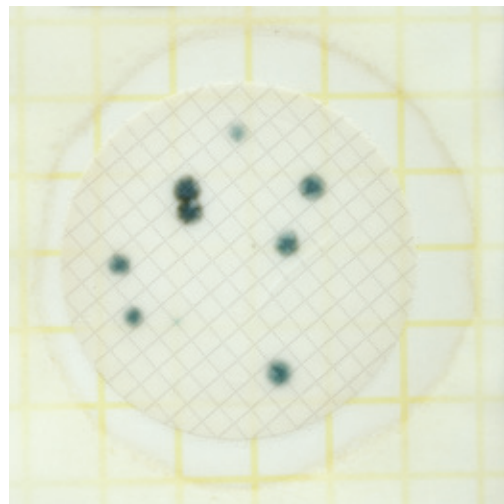
[See Page 3](#)



## 3M™ Petrifilm™ Aqua Yeast and Mold Count Plate (AQYM)

The 3M Petrifilm Aqua AQYM Plate is a sample-ready culture medium system which contains nutrients supplemented with antibiotics, a cold-water-soluble gelling agent, and an indicator that facilitates yeast and mold enumeration. 3M Petrifilm Aqua AQYM Plates are used for the enumeration of yeast and mold in bottled water industry. See Product Instructions for more information on differentiating yeast and mold colonies.

[See Pages 4–5](#)



<sup>1</sup> 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.

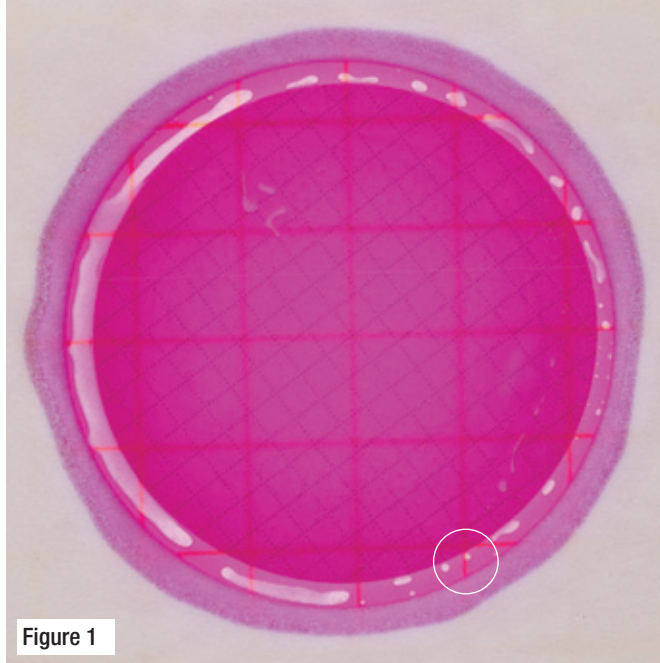
<sup>2</sup> Q Laboratories, Inc., Cincinnati, OH, USA study comparing 3M Petrifilm Aqua Plate performance vs. reference methods. Study presented at 2011 International Association for Food Protection (IAFP).

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

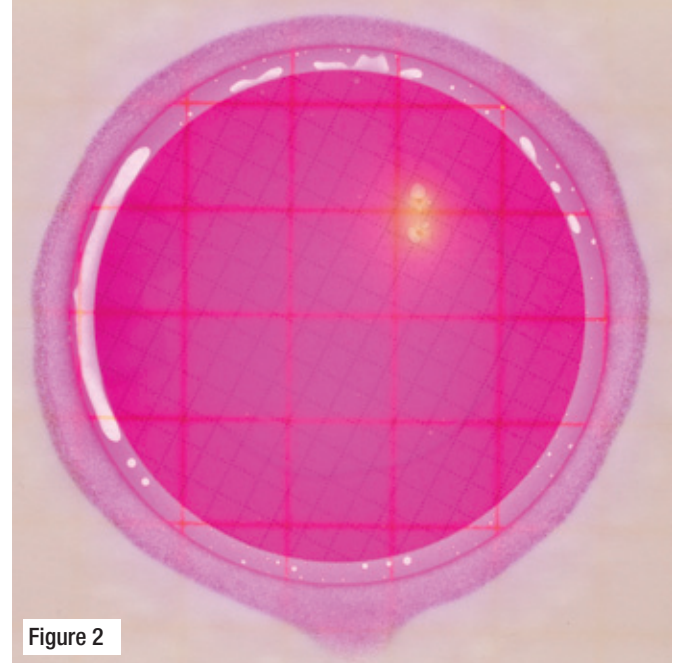
<sup>4</sup> SO 6222, ISO 9308-1

# 3M™ Petrifilm™ Aqua Enterobacteriaceae Count Plate (AQEB)

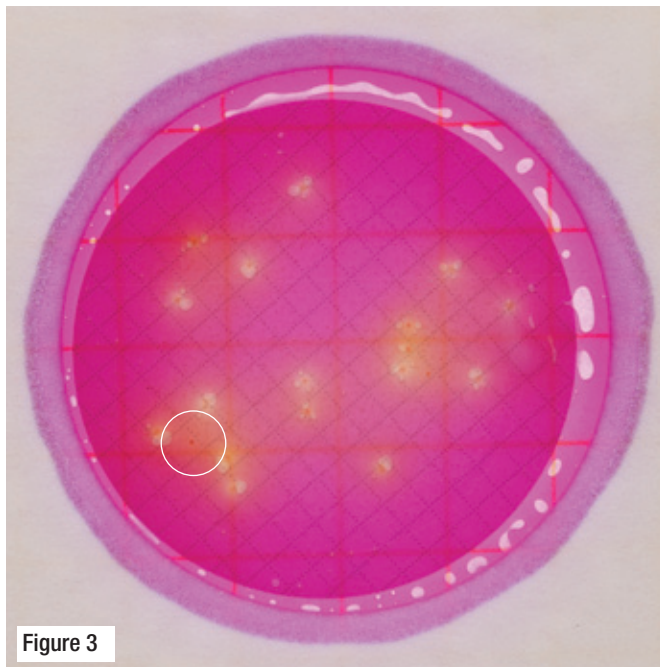
## Negative Plate and Plates with Colonies



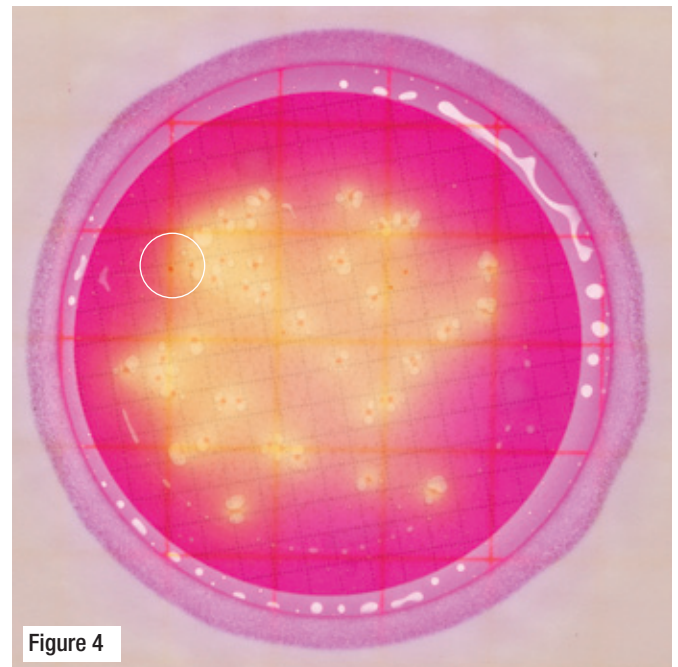
AQEB plate  
Count: 0  
Observation: Gas bubbles surrounding filter do not indicate microbial growth. See circle for example.



AQEB plate with low count  
Count: 2 cfu  
Observation: Enterobacteriaceae are identified by the presence of acid (yellow halo) and/or colony-associated gas bubbles.



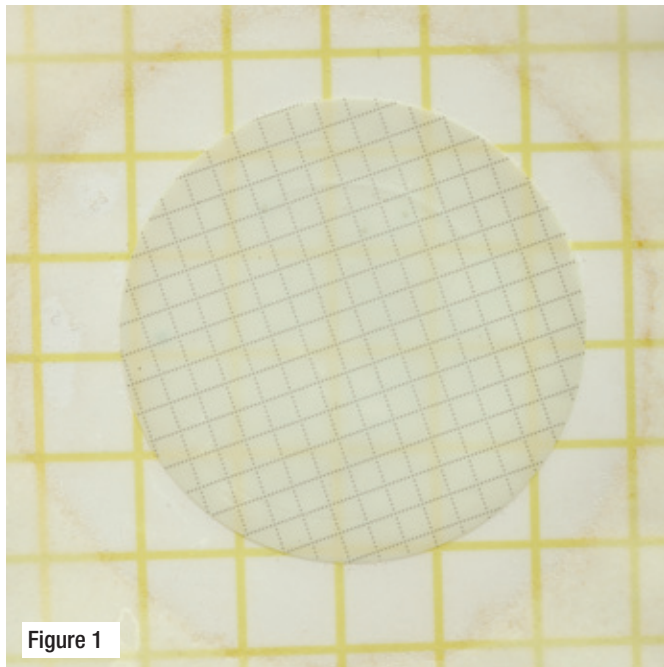
AQEB plate with high count  
Count: 17 cfu  
Observation: Red colonies without acid or gas production (circle) are not counted as Enterobacteriaceae.



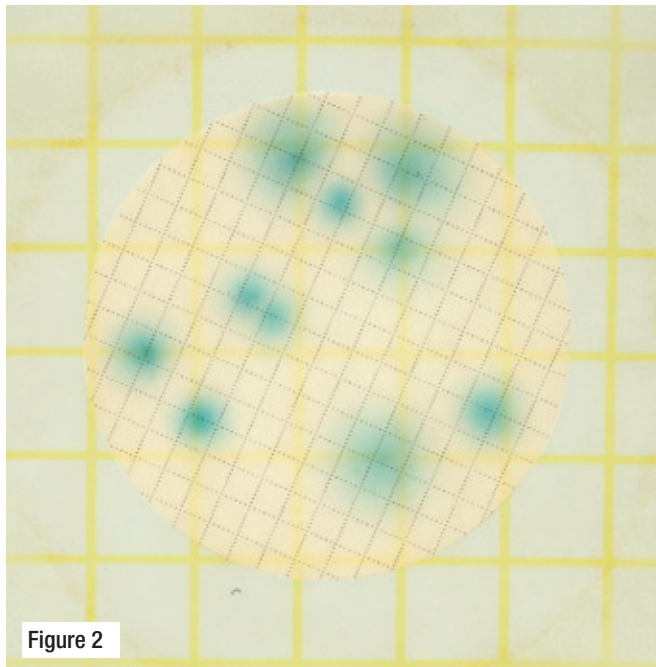
AQEB plate with high count  
Count: 43 cfu  
Observation: Colony color can vary from pink to faint tan. Yellow halo and large gas bubbles can be associated with very faint colonies. Red colony not associated with either acid production or gas are not counted as Enterobacteriaceae (see circle).

## 3M™ Petrifilm™ Aqua Yeast and Mold Count Plate (AQYM)

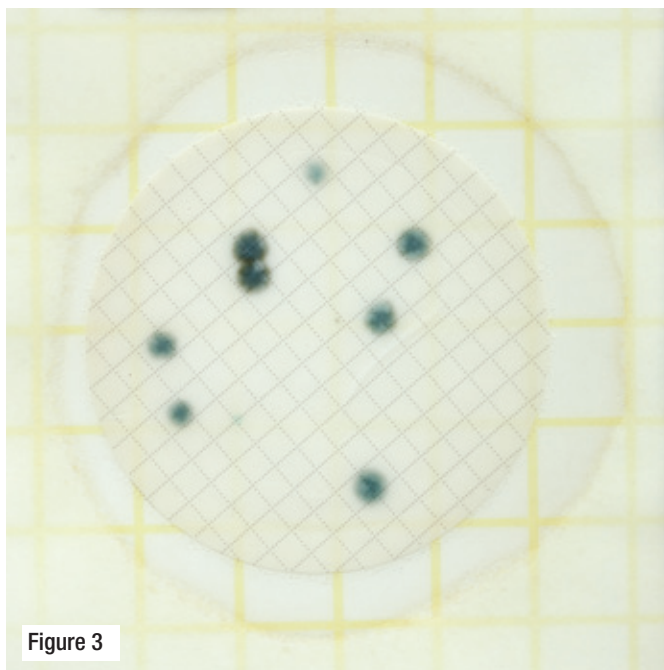
### Negative Plate and Plates with Colonies



AQYM plate  
Count: 0

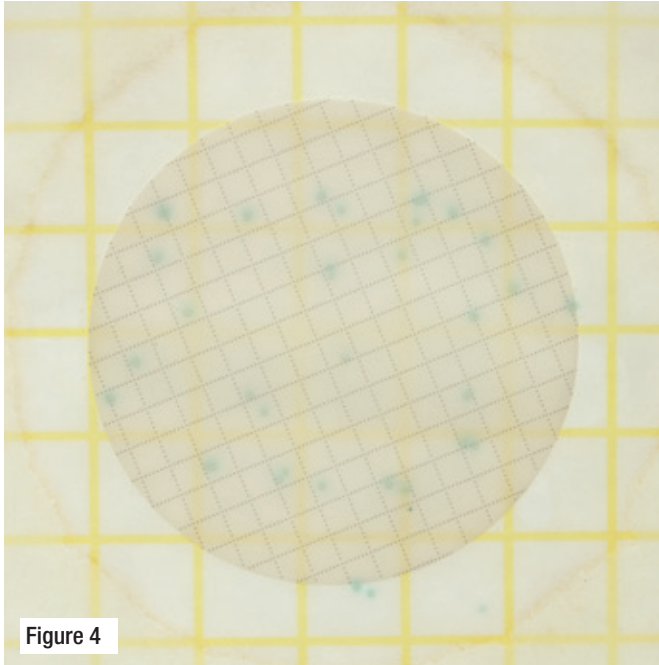


AQYM plate with low count  
Count: 10 cfu  
Observation: Mold colonies are large with a dark center and diffuse edge.

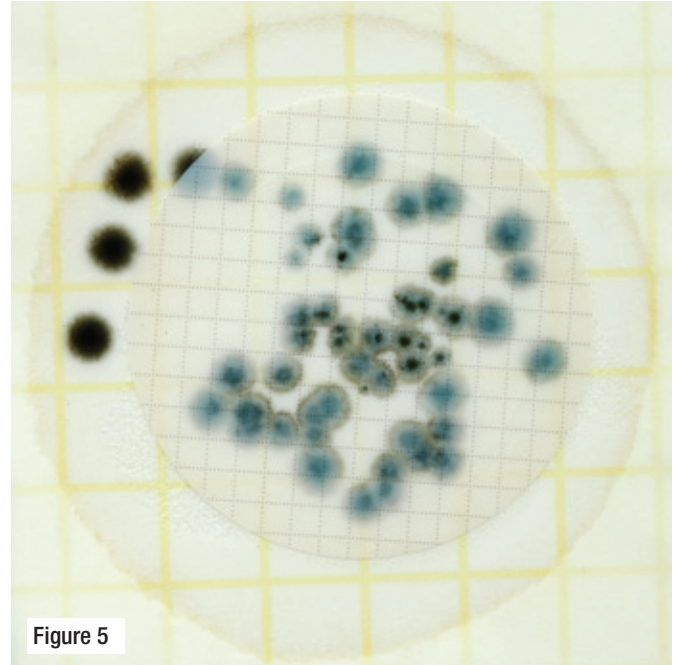


AQYM plate with low count  
Count: 10 cfu  
Observation: Note two small, faint colonies.

## Plates with High Counts



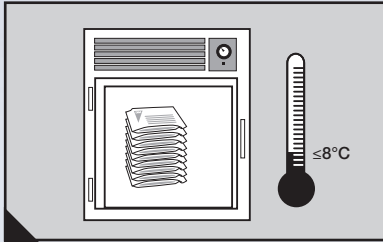
AQYM plate with high count  
Count: 31 cfu  
Observation: Yeast colonies.



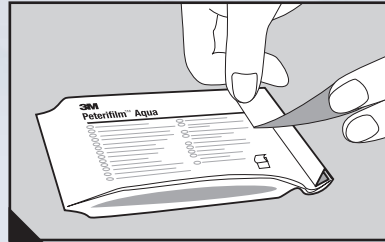
AQYM plate with high count  
Count: 51 cfu  
Observation: Estimate colony count when molds merge; darker centers can help enumerate colonies. Count colonies partially or totally off of the filter.

## 3M™ Petrifilm™ Aqua Enterobacteriaceae Count Plate (AQEB)

### Storage for Plates

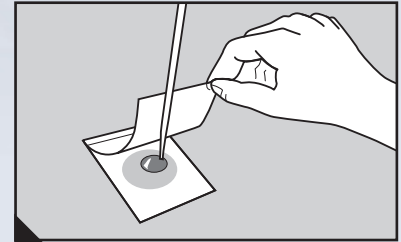


**A** Store unopened packages at  $\leq 8^{\circ}\text{C}$  ( $\leq 46^{\circ}\text{F}$ ). Use before expiration date on package. In areas of high humidity where condensate may be an issue, it is best to allow packages to reach room temperature before opening.

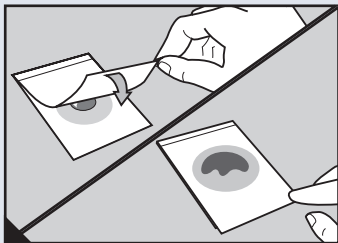


**B** To seal opened package, fold end over and tape shut. **Do not refrigerate opened packages.** Use 3M Petrifilm Aqua AQEB Plates within one month after opening.

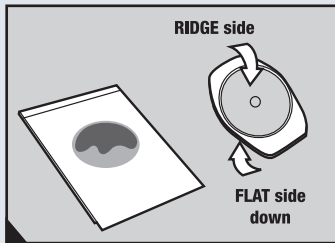
### Hydration Procedure



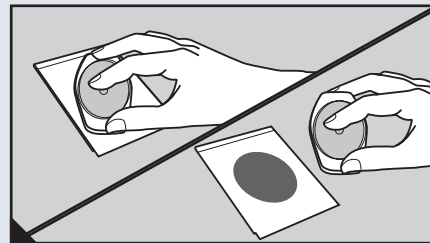
**C** Place 3M Petrifilm Aqua AQEB Plate on a **level surface**. With the pipette **perpendicular** to the 3M Petrifilm Aqua AQEB Plate, place hydration diluent onto the center of the bottom film.



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

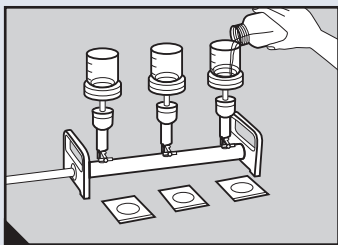


**E** With **flat side** down, place spreader on top film over hydration diluent.

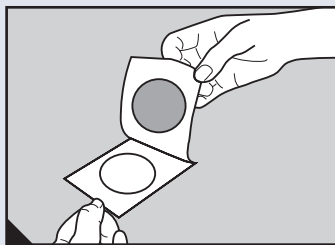


**F**

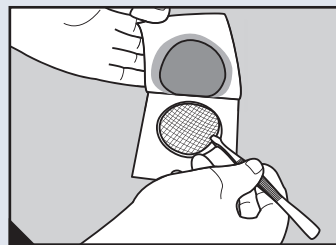
- Gently apply pressure on spreader to distribute inoculum or hydration diluent over circular area before gel is formed. Do not twist or slide spreader. Lift spreader.
- When **inoculating with hydration diluent**, allow the hydrated plates to remain closed for a minimum of one hour before use. Proceed to step 'G'.
- Any additional hydrated 3M Petrifilm Aqua AQEB 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.



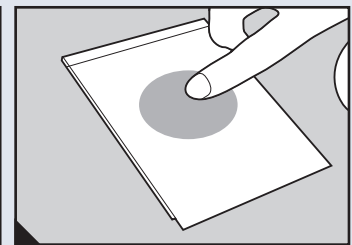
**G** Following standard procedures for water analysis, membrane filter water sample using a 47mm, **0.45 micron pore size** Mixed Cellulose Ester (MCE) filter.



**H** Lift top film.

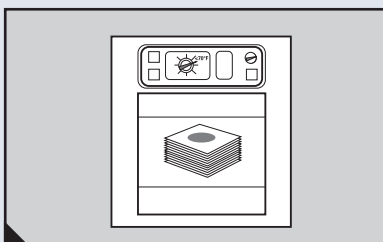


**I** Place filter in the center of the well. Roll top film down to **minimize air bubbles** or gaps between the filter and the 3M Petrifilm Aqua AQEB Plate.



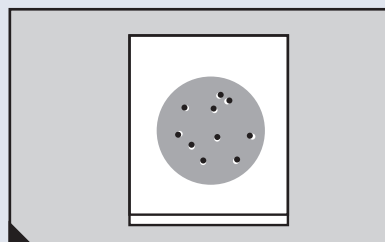
**J** Lightly apply pressure to ensure uniform contact of the filter with the gel and to eliminate any air bubbles.

### Incubation

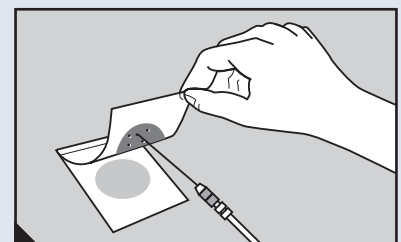


**K** Incubate 3M Petrifilm Aqua AQEB Plates in a horizontal position, clear side up, in stacks on no more than 20 plates at  $34-37^{\circ}$  for  $24 \pm 2$  hours.

### Interpretation



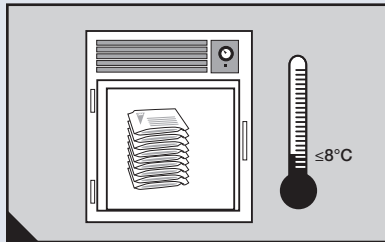
**L** 3M Petrifilm Aqua AQEB Plates can be counted on a standard colony counter or other illuminated magnifier. Refer to the *Interpretation Guide* section when reading results.



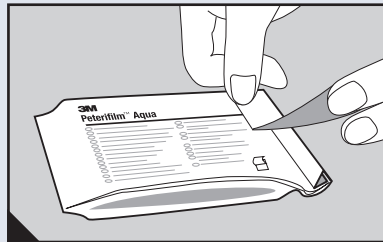
**M** Colonies may be isolated for further identification. Lift top film and pick the colony from the gel.

# 3M™ Petrifilm™ Aqua Yeast and Mold Count Plate (AQYM)

## Storage for Plates

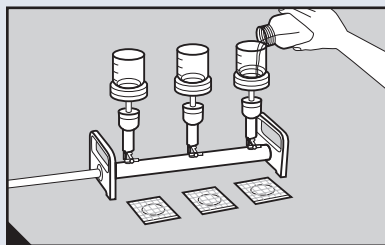


**A** Store unopened packages at  $\leq 8^{\circ}\text{C}$  ( $\leq 46^{\circ}\text{F}$ ). Use before expiration date on package. In areas of high humidity where condensate may be an issue, it is best to allow packages to reach room temperature before opening.

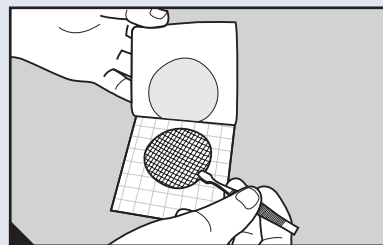


**B** To seal opened package, fold end over and tape shut. **Do not refrigerate opened packages.** Use 3M Petrifilm Aqua AQYM Plates within one month after opening.

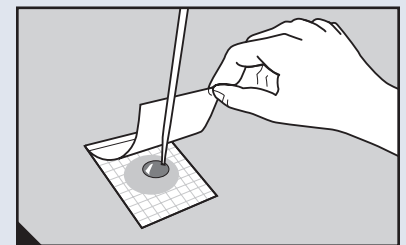
## Inoculation or Hydration Procedure



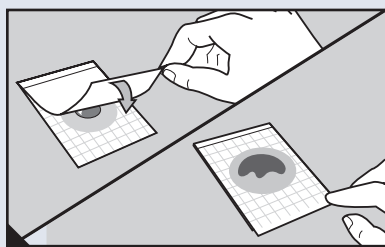
**C** Following standard procedures for water analysis, membrane filter water sample using a 47mm, **0.45 micron pore size** Mixed Cellulose Ester (MCE) filter.



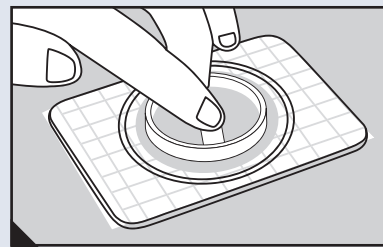
**D** Place filter in the center of bottom film.



**E** With the pipette **perpendicular** to the 3M Petrifilm Aqua AQYM Plate, place 1 mL of sample or hydration diluent onto the center of the filter.

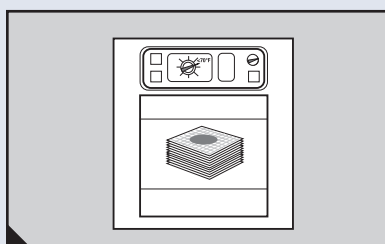


**F** Carefully **roll** top film so that it contacts the sample or hydration diluent and then drop the top film.



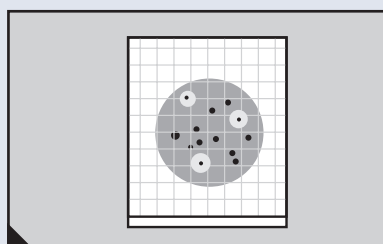
**G** Lightly apply pressure to the Yeast and Mold Spreader to ensure uniform contact of the filter with the gel and to eliminate any air bubbles.

## Incubation

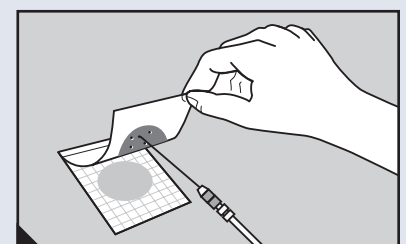


**H** Incubate 3M Petrifilm Aqua AQYM Plates in a horizontal position, clear side up, in stacks on no more than 20 plates at  $20\text{--}25^{\circ}\text{C}$  for 3–5 days. At day 5, additional colonies may be visible.

## Interpretation



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



**J** 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](http://www.3M.com/foodsafety).



**3M Food Safety**

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**3M Latin America**

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1-651-737-2239

**3M Asia Pacific**

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Singapore, 768923  
65-64508869



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.



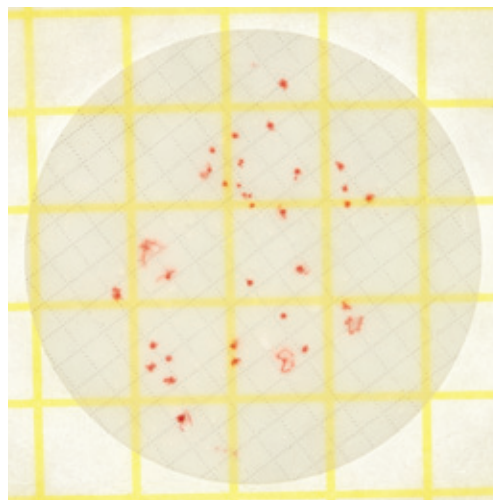
The 3M™ Petrifilm™ Aqua Plate system brings the convenience of 3M Petrifilm Plate technology to water testing<sup>1</sup>. The 3M Petrifilm Aqua Plate's compact, easy-to-use format brings space savings and reduced waste to the laboratory. An independent, third party study<sup>2</sup> indicates 3M Petrifilm Aqua Plates do not perform statistically different from either SMEWW<sup>3</sup> or ISO<sup>4</sup> 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.

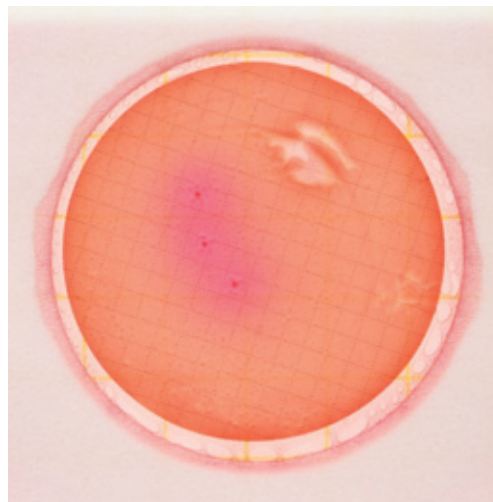
See Pages 3–5



## 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

<sup>1</sup> 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.

<sup>2</sup> 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).

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

<sup>4</sup> SO 6222, ISO 9308-1

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

## Negative Plate and Plates with Colonies on Filters

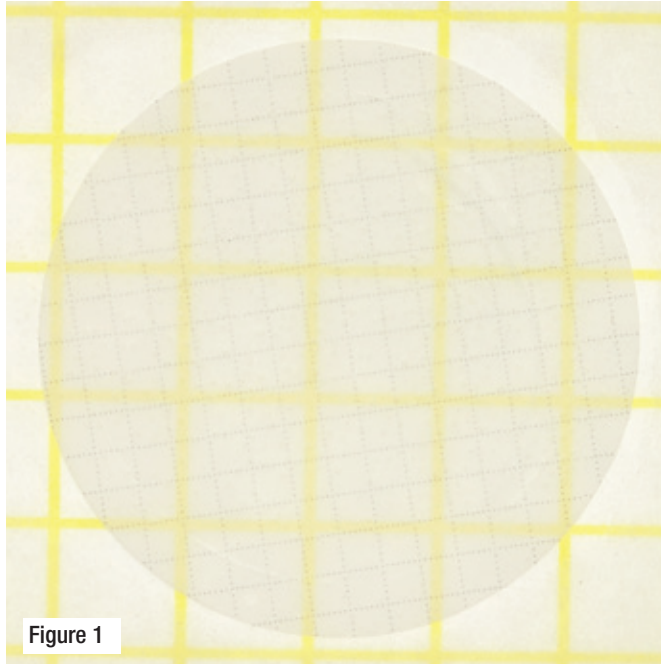


Figure 1

AQHC plate with filter  
Count: 0

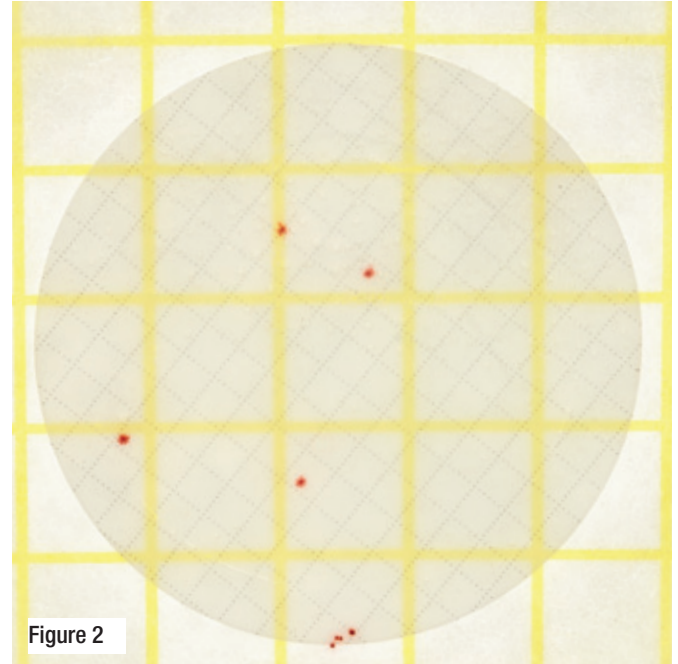


Figure 2

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

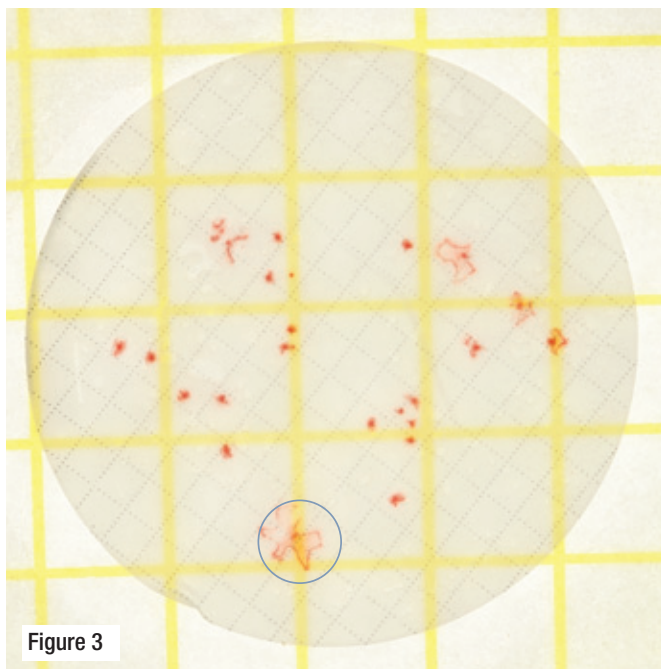


Figure 3

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.

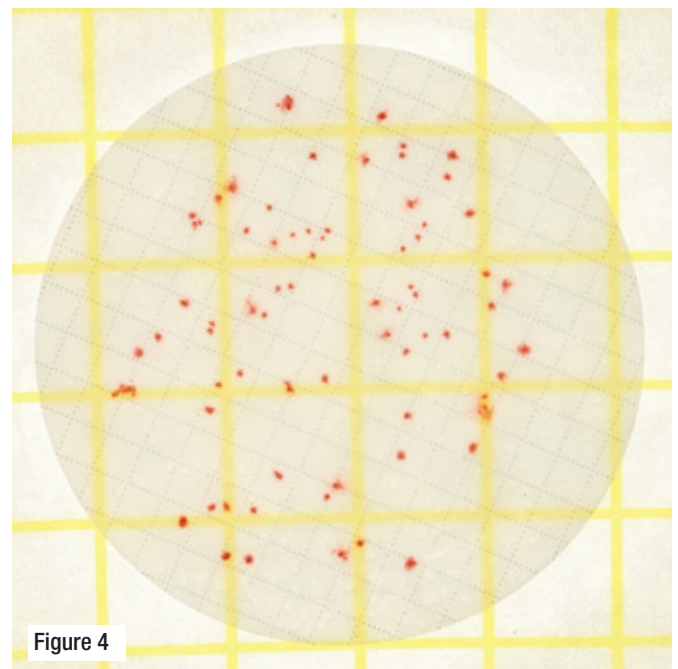


Figure 4

AQHC plate with high count on filter  
Count: 71 cfu

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

### Plates with High Counts on Filters

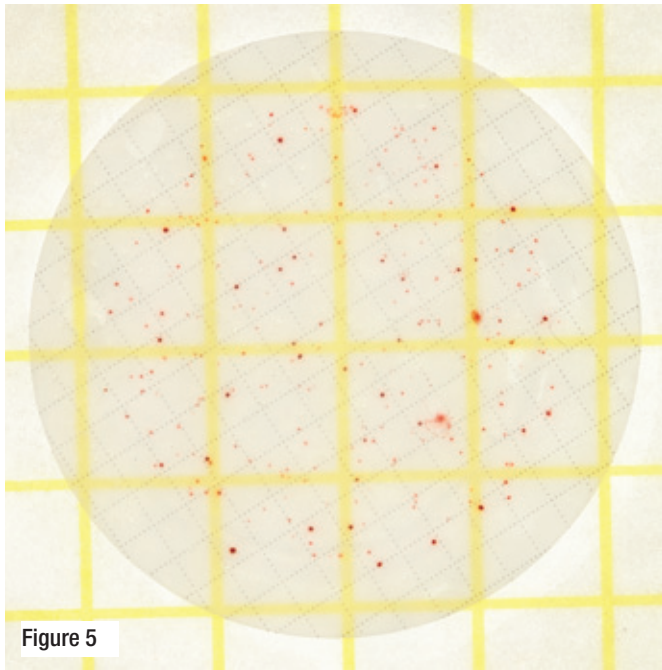


Figure 5

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

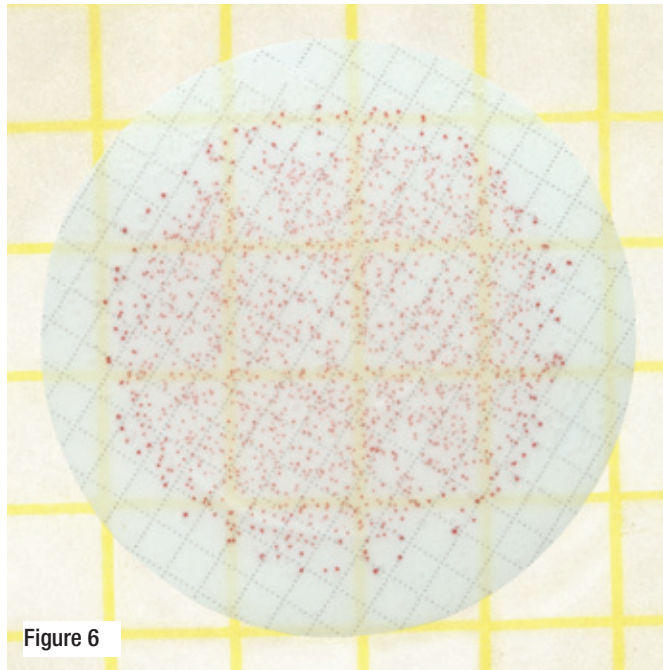


Figure 6

AQHC plate with colonies too numerous to count on filter

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

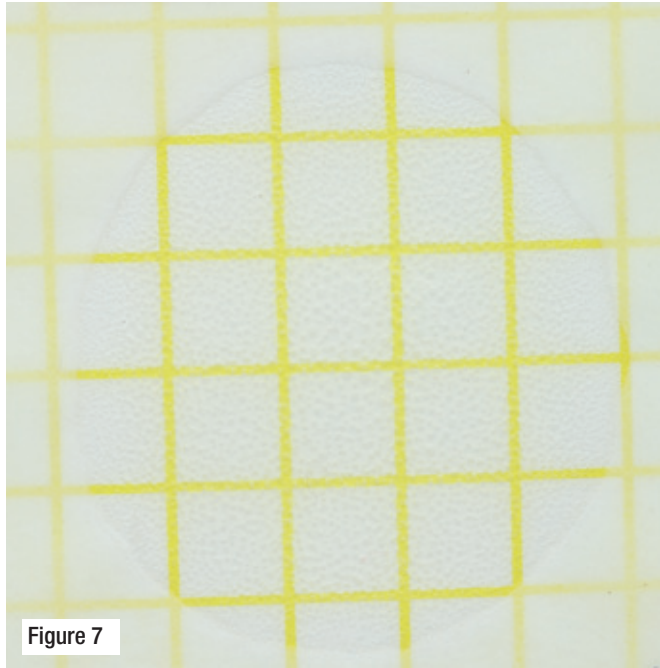


Figure 7

AQHC plate  
Count: 0

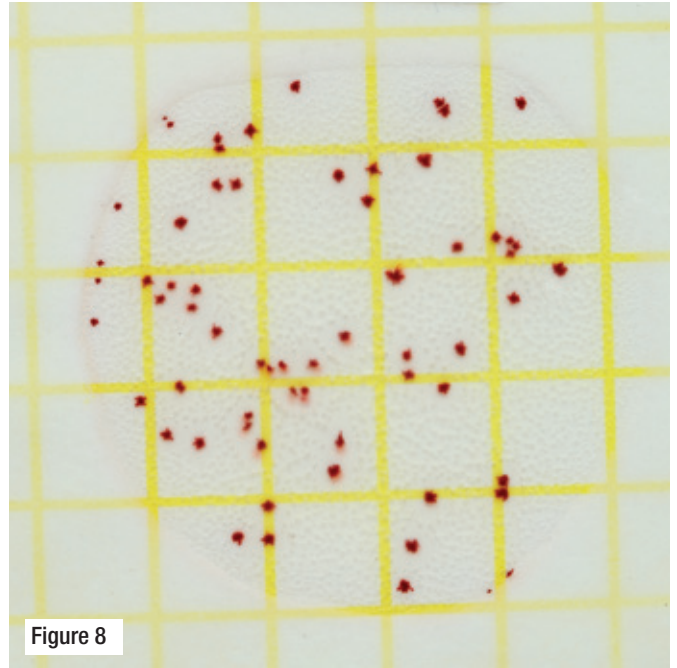


Figure 8

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

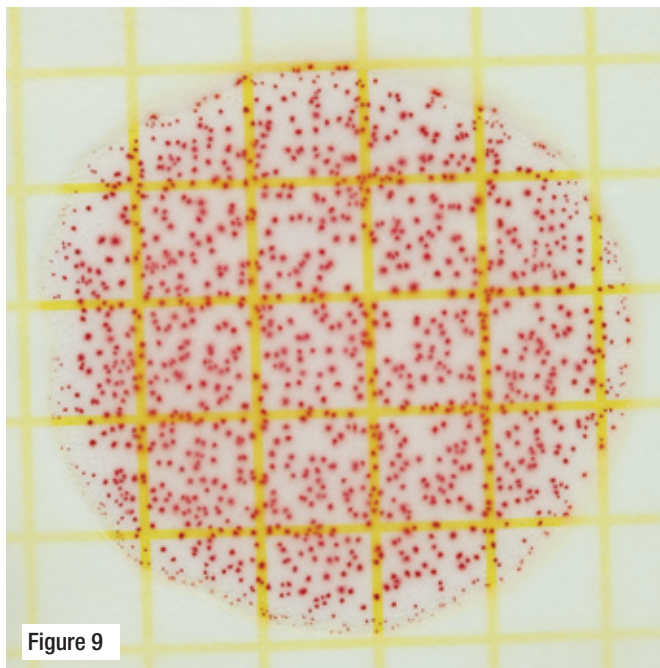


Figure 9

AQHC plate with colonies too numerous to count  
Count: estimate  $10^3$  cfu  
Observation: Determine the average number of colonies in one square (1cm<sup>2</sup>) 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

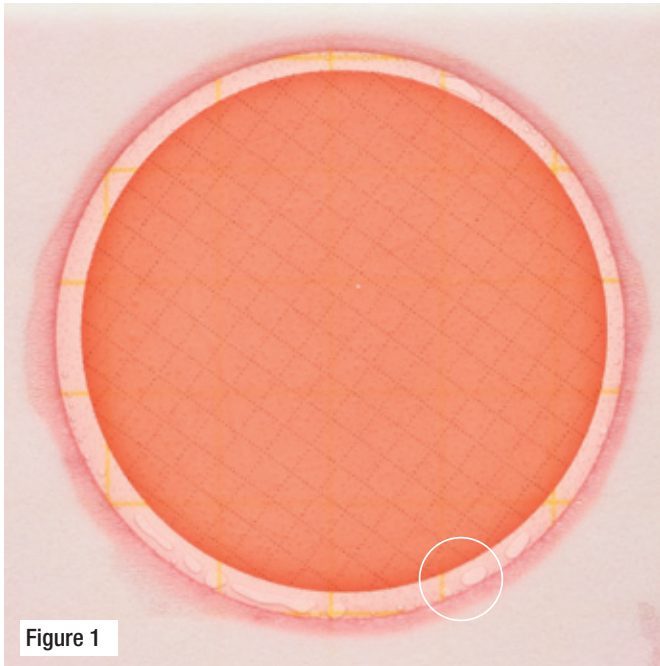


Figure 1

AQCC plate with filter

Count: 0

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

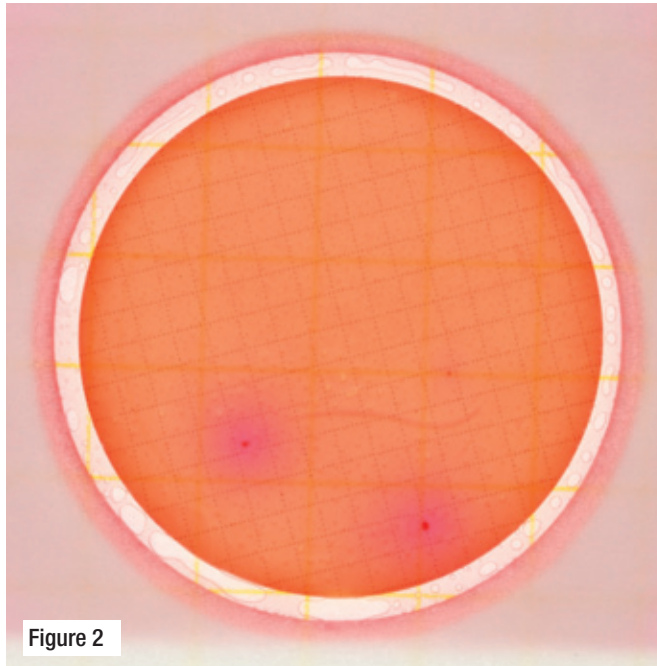


Figure 2

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.

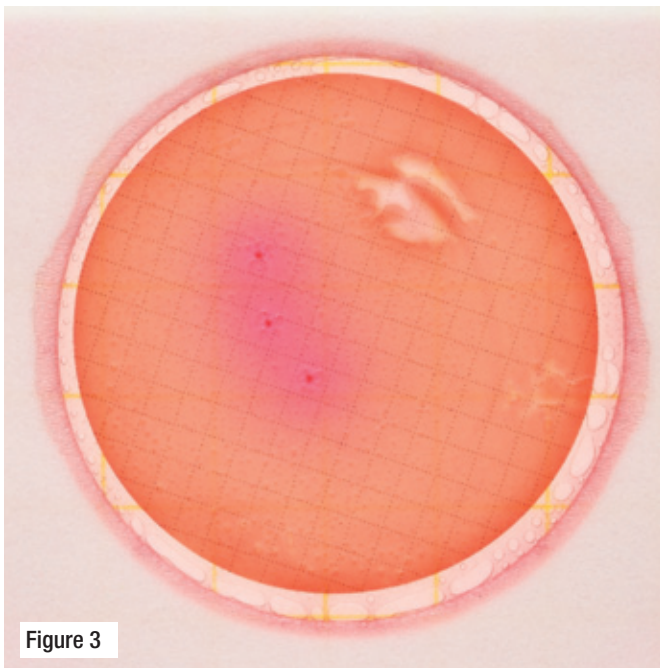


Figure 3

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

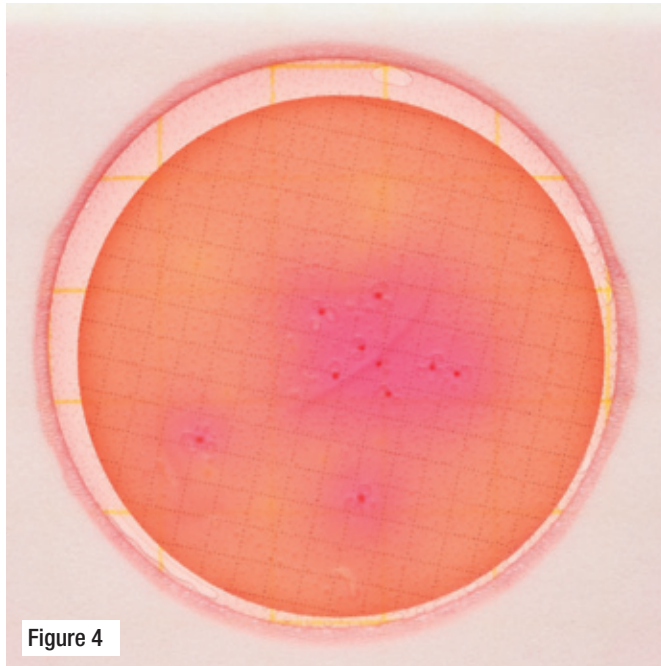


Figure 4

AQCC plate with high count on filter  
Count: 10 cfu

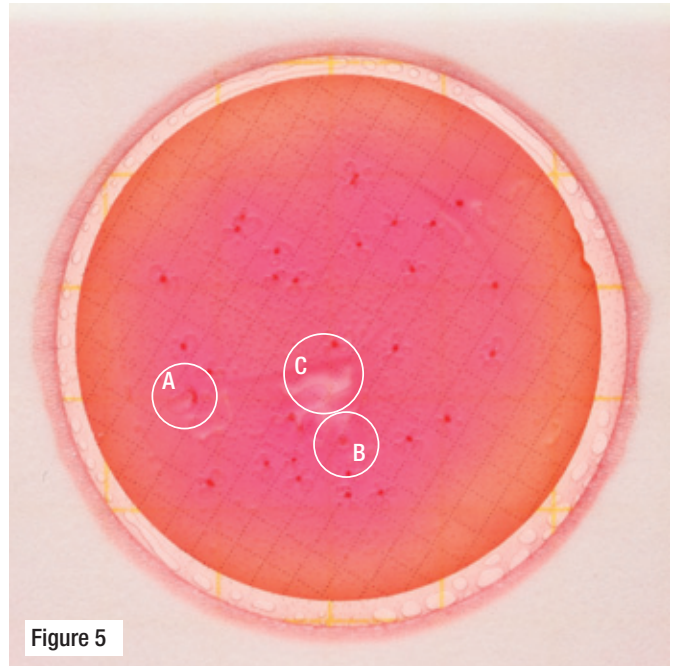
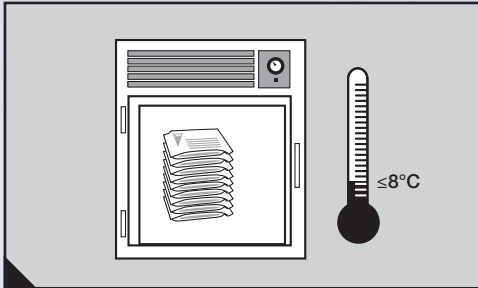


Figure 5

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

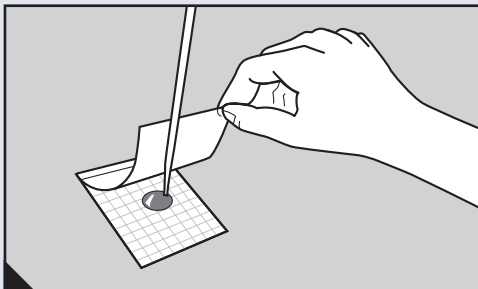


**A** Store unopened packages at  $\leq 8^{\circ}\text{C}$  ( $\leq 46^{\circ}\text{F}$ ). Use before expiration date on package. In areas of high humidity where condensate may be an issue, it is best to allow packages to reach room temperature before opening.

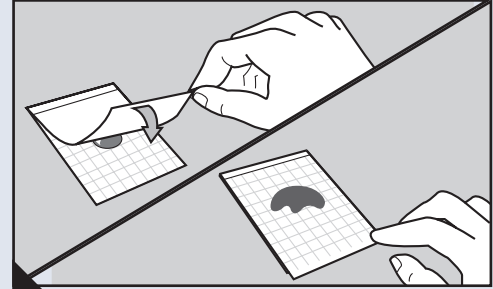


**B** To seal opened package, fold end over and tape shut. **Do not refrigerate opened packages.** Use 3M Petrifilm Aqua AQHC Plates within one month after opening.

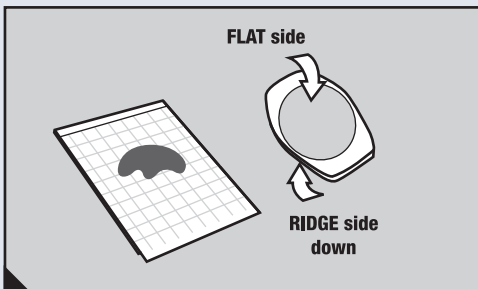
### Inoculation or Hydration Procedure



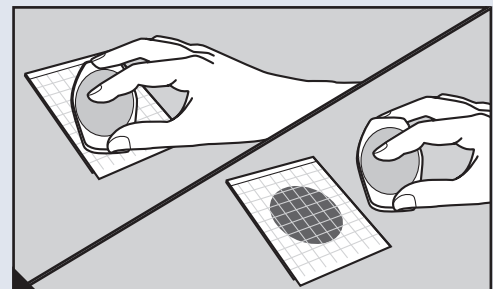
**C** Place 3M Petrifilm Aqua Plate on a **level surface**. With the pipette **perpendicular** to the 3M Petrifilm Aqua AQHC Plate, place 1 mL of sample OR hydration diluent onto the center of the bottom film.



**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.

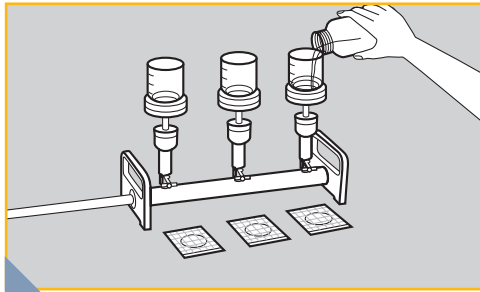
### IMPORTANT

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

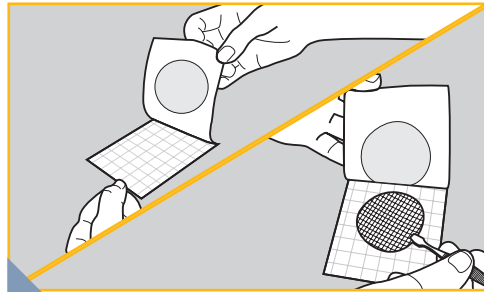
If you are using a 3M Petrifilm Aqua AQHC Plate with a filter, proceed to step 'G'.



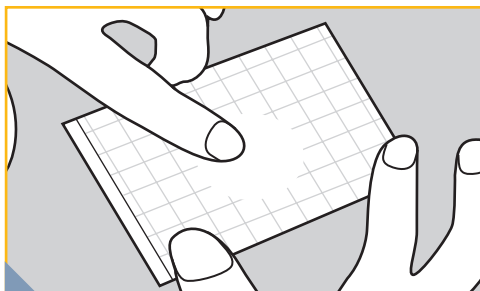
## Inoculation Steps for Plates with Filters



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

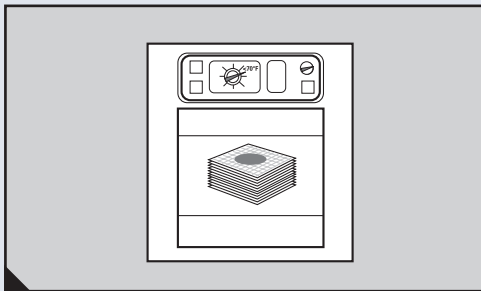


**H** Lift the top film. Place filter in the center of the hydration area, grid side up. Roll top film down to **minimize air bubbles** or gaps between the filter and the 3M Petrifilm Aqua AQHC Plate.



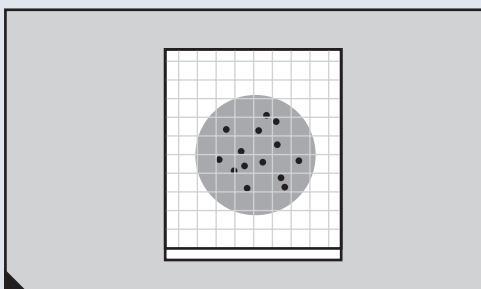
**I** Lightly apply pressure to ensure uniform contact of the filter with the gel and to eliminate any air bubbles.

## Incubation

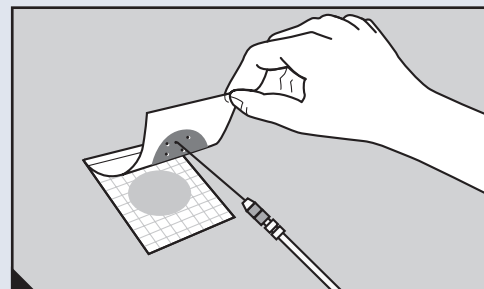


**J** Incubate 3M Petrifilm Aqua AQHC Plates in a horizontal position, clear side up, in stacks on no more than 20 plates:  
**Plate with Filter Procedure:**  $35^{\circ} \pm 2^{\circ}\text{C}$  for  $48 \pm 3$  hours  
**Direct Plate Procedure:**  $22^{\circ} \pm 2^{\circ}\text{C}$  for  $68 \pm 4$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

## Interpretation



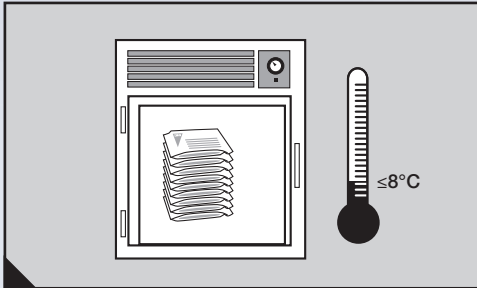
**K** 3M Petrifilm Aqua AQHC Plates can be counted on a standard colony counter or other illuminated magnifier. Refer to the *Interpretation Guide* section when reading results.



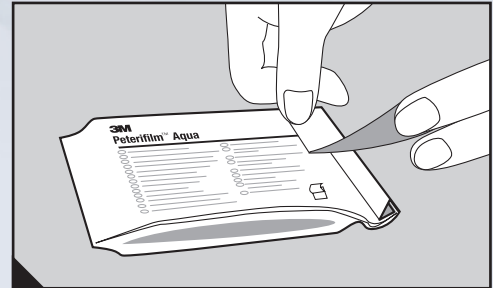
**L** Colonies may be isolated for further identification. Lift top film and pick the colony from the gel.

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

### Storage for Plates

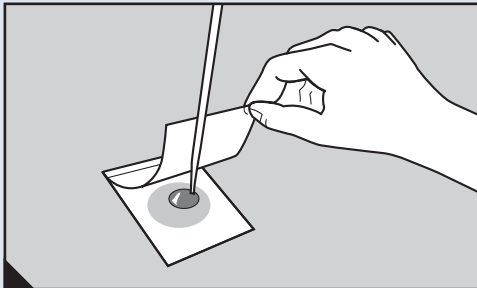


**A** Store unopened packages at  $\leq 8^{\circ}\text{C}$  ( $\leq 46^{\circ}\text{F}$ ). Use before expiration date on package. In areas of high humidity where condensate may be an issue, it is best to allow packages to reach room temperature before opening.

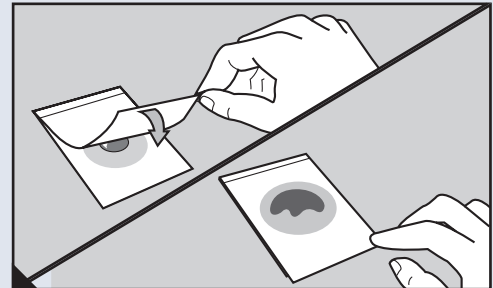


**B** To seal opened package, fold end over and tape shut. **Do not refrigerate opened packages.** Use 3M Petrifilm Aqua AQCC Plates within one month after opening.

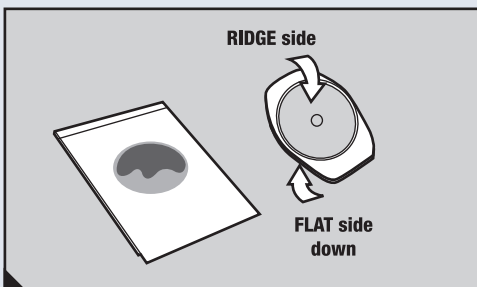
### Hydration Procedure



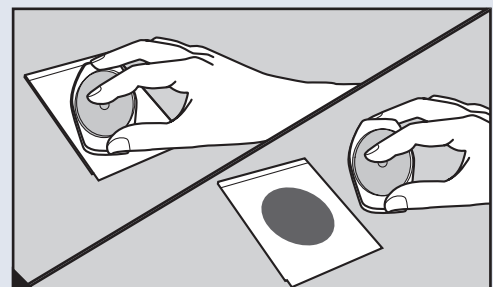
**C** Place 3M Petrifilm Aqua AQCC Plate on a **level surface**. With the pipette **perpendicular** to the 3M Petrifilm Aqua Plate, place hydration diluent onto the center of the bottom film.



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

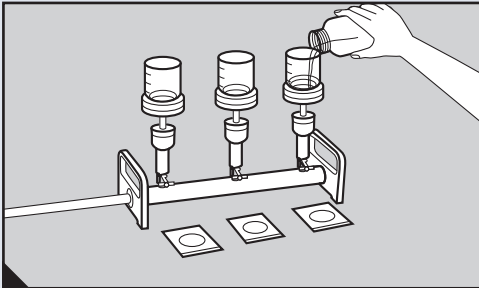


**E** With **flat** side down, place spreader on top film over hydration diluent.

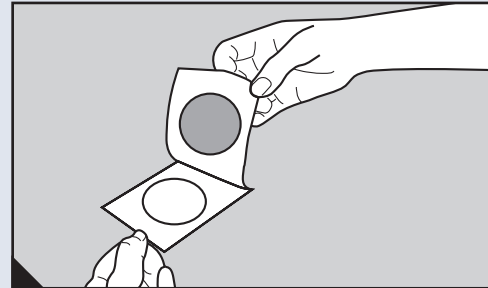


**F**

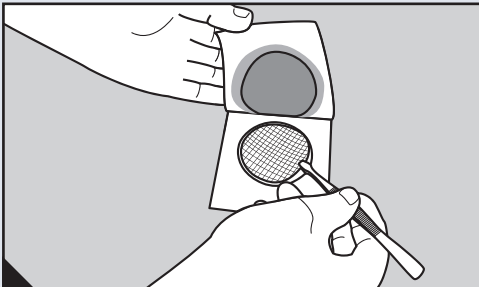
- **Gently** apply pressure on spreader to distribute inoculum or hydration diluent over circular area before gel is formed. Do not twist or slide spreader. Lift spreader.
- Allow the hydrated plates to remain closed for a minimum of one hour before use. Proceed to step 'G'.
- Any additional hydrated 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.



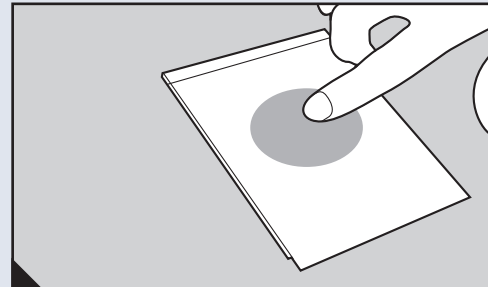
**G** Following standard procedures for water analysis, membrane filter water sample using a 47mm, **0.45 micron pore size Mixed Cellulose Ester (MCE) filter**.



**H** Lift top film.

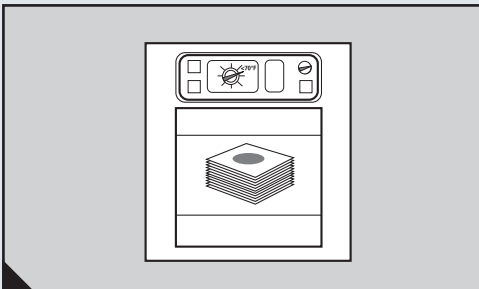


**I** Place filter in the center of the well. Roll top film down to **minimize air bubbles** or gaps between the filter and the 3M Petrifilm Aqua AQCC Plate.



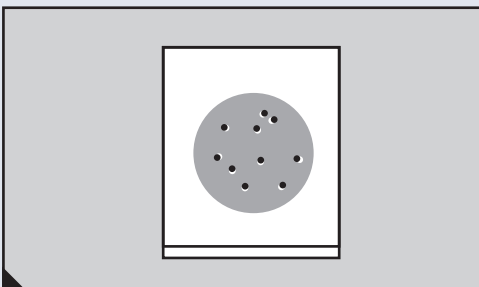
**J** Lightly apply pressure to ensure uniform contact of the filter with the gel and to eliminate any air bubbles.

## Incubation

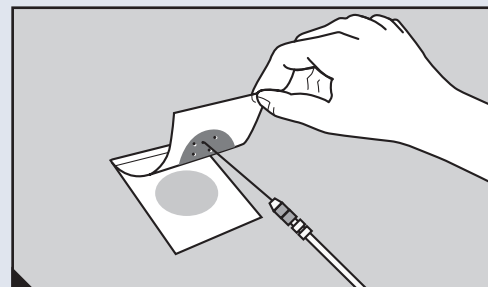


**K** Incubate 3M Petrifilm Aqua AQCC Plates in a horizontal position, clear side up, in stacks on no more than 20 plates at  $35^{\circ}\pm 1^{\circ}\text{C}$  for  $24 \pm 2$  hours or  $36^{\circ}\pm 1^{\circ}\text{C}$  for  $24 \pm 2$  hours.

## 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.  
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