

3M

Petrifilm™

3M Food Safety

Certifications, Recognitions and Validations

Issue Date: May, 2018



3M™ Petrifilm™ Plate Certificates, Recognitions and Validations

International Recognition

3M Food Safety is certified to ISO 9001 for design and manufacturing

AFNOR Certification		
All human food products ¹ , pet food and industrial environmental samples	Aerobic Count Plates	NF VALIDATION Certificate Number 3M 01/1-09/89 ² (as compared to ISO 4833 method)
Milk powders and dairy products	Rapid Aerobic Count Plates	NF VALIDATION Certificate Number 3M 01/17-11/16 ² (as compared to ISO 4833-1 method)
All human food products ¹ (except raw shellfish), pet food and industrial environmental samples	Coliform Count Plates 24 hour total coliform result	NF VALIDATION Certificate Number 3M 01/2-09/89A ² (as compared to ISO 4832 VRBL method)
All human food products ¹ (except raw shellfish)	Coliform Count Plates 24 hour total coliform result	NF VALIDATION Certificate Number 3M 01/2-09/89B ² (as compared to ISO 4831 MPN method)
All human food products ¹	Coliform Count Plates 24 hour thermotolerant coliform result	NF VALIDATION Certificate Number 3M 01/2-09/89C ²
All human food products ¹ , pet food and industrial environmental samples	Select <i>E. coli</i> Count Plates	NF VALIDATION Certificate Number 3M 01/8-06/01 ² (as compared to ISO 16649-2)
All human food products ¹	Rapid Coliform Count Plates 14 hour result (Incubate at 30°C for processed pork products and seafood)	NF VALIDATION Certificate Number 3M 01/5-03/97A ² (as compared to ISO 4832 VRBL 30°C method)
	Rapid Coliform Count Plates 24 hour result (Incubate at 30°C for processed pork products and seafood)	NF VALIDATION Certificate Number 3M 01/5-03/97B ² (as compared to ISO 4832 VRBL 30°C method)
All human food products ¹ (except processed pork products)	Rapid Coliform Count Plates 24 hour result (Incubate at 30°C for seafood products)	NF VALIDATION Certificate Number 3M 01/5-03/97C ² (as compared to ISO 4831 MPN 30°C method)
All human food products ¹ , animal feed and industrial environmental samples	<i>Enterobacteriaceae</i> Count Plates	NF VALIDATION Certificate Number 3M 01/6-09/97 ² (as compared to ISO 21528 part 2 VRBG method)
All human food products ¹	High-Sensitivity Coliform Count Plates	NF VALIDATION Certificate Number 3M 01/7-03/99 ² (as compared to ISO 4831 MPN method)
All human food products ¹ and pet food	Staph Express System	NF VALIDATION Certificate Number 3M 01/9-04/03A ² (as compared to EN ISO 6888-1 method)
All human food products ¹ and pet food	Staph Express System	NF VALIDATION Certificate Number 3M 01/9-04/03B ² (as compared to EN ISO 6882-2 method)

3M™ Petrifilm™ Plate Certificates, Recognitions and Validations

International Recognition *(cont.)*

3M Food Safety is certified to ISO 9001 for design and manufacturing

AFNOR Certification

All human food products ¹ , animal feeding stuffs and product environmental samples	Rapid Yeast and Mold Count Plates	NF VALIDATION Certificate Number 3M 01/13-07/14 ² (as compared to ISO 21527-1 method and ISO 21527-2 method)
All human food products ¹ (excluding yoghurts) and industrial environmental samples	Lactic Acid Bacteria Count Plates	NF VALIDATION Certificate Number 3M 01/19-11/17 ² (as compared to ISO 15214 method)

¹ Validation study performed on a broad range of foods

² For more information about the end of validity please refer to NF VALIDATION Certificate available on <http://nf-validation.afnor.org/en>

AOAC® INTERNATIONAL *Official Method of Analysis*SM

Raw and pasteurized milk	Aerobic Count, Coliform Count Plates	Method 986.33
Dairy products	Aerobic Count, Coliform Count Plates	Method 989.10
	High-Sensitivity Coliform Count Plates	Method 996.02
Foods	Aerobic Count Plates	Method 990.12
	Coliform Count, <i>E. coli</i> /Coliform Count Plates	Method 991.14
	Yeast and Mold Count Plates	Method 997.02
	Rapid Coliform Count Plates	Method 2000.15
Poultry, meats and seafood	<i>E. coli</i> /Coliform Count Plates	Method 998.08
	<i>Enterobacteriaceae</i> Count Plates	Method 2003.01
	<i>Salmonella</i> Express System	Method 2014.01
Selected processed and prepared foods	Staph Express System	Method 2003.07
Selected dairy foods	Staph Express System	Method 2003.08
Selected poultry, meats and seafood	Staph Express System	Method 2003.11
Variety of foods	Rapid Yeast and Mold Count Plates	Method 2014.05
	Rapid Aerobic Count Plates	Method 2015.13

3M™ Petrifilm™ Plate Certificates, Recognitions and Validations

International Recognition *(cont.)*

3M Food Safety is certified to ISO 9001 for design and manufacturing

AOAC® Performance Tested MethodSM

Environmental sampling	Environmental <i>Listeria</i> Plates	Certificate Number 030601
Bottled water	Aqua Coliform Count Plates	Certificate Number 091101
Variety of Foods	<i>Salmonella</i> Express System	Certificate Number 061301
Variety of Foods	Rapid Yeast and Mold Count Plates	Certificate Number 121301
Broad Range of Foods	Rapid Aerobic Count Plates	Certificate Number 121403
Select Foods and Environmental Samples	Lactic Acid Bacteria Count Plates	Certificate Number 041701
Broad Range of Foods and Select Environmental Samples	Rapid <i>E. coli</i> /Coliform Count Plates	Certificate Number 051801

The above methods' performance was reviewed by AOAC® Research Institute and was found to perform to the manufacturer's specifications.

INTERNATIONAL DAIRY FEDERATION (FIL/IDF)

Dairy products	Bulletins 285/1993 and 350/2000
----------------	---------------------------------

Recognition by Country

Australia

Department of Agriculture/Australian Quarantine and Inspection Service (AQIS)

ESAM (Carcass sampling)	Aerobic Count Plates	Section 4
Meat and meat products methods	<i>E. coli</i> /Coliform Count Plates	Microbiological Methods for Meat Products for Export

Victorian Dairy Industry Authority (VDIA)

Milk and dairy products	Aerobic Count Plates	Certificate Number 9503
	Coliform Count Plates	Certificate Number 9504

3M™ Petrifilm™ Plate Certificates, Recognitions and Validations

Recognition by Country *(cont.)*

3M Food Safety is certified to ISO 9001 for design and manufacturing

Belgium

All foods	Aerobic Count Plates, Yeast and Mold Count Plates, Staph Express System, Select <i>E. coli</i> Count Plates, <i>Enterobacteriaceae</i> Count Plates, Coliform Count Plates, High Sensitivity Coliform Count Plates, Rapid Coliform Count Plates	List of Approved Microbiological Methods - Version 16, December, 2013
-----------	---	---

Brazil

Ministry of Agriculture

Carcass sampling	<i>E. coli</i> /Coliform Count Plates	IN 40, 2005
------------------	---------------------------------------	-------------

Canada

Health Protection Branch, Compendium of Analytical Methods

Laboratory procedures	Aerobic Count Plates, Coliform Count Plates, <i>E. coli</i> /Coliform Count Plates, Yeast and Mold Count Plates	Method MFLP-41
Environmental sampling	High-Sensitivity Coliform Count Plates	Method MFLP-41B
	Environmental <i>Listeria</i> Plates	Method MFLP-11
Dairy products	High-Sensitivity Coliform Count Plates	Method MFLP-85
Food products and environmental sampling	Staph Express System	Method MFLP-85

Health Protection Branch Methods

Food products and ingredients	Aerobic Count Plates	Method MFHPB-33
	Coliform Count Plates	Method MFHPB-35
	<i>E. coli</i> /Coliform Count Plates	Method MFHPB-34
	Yeast and Mold Count Plates	Method MFHPB-32

3M™ Petrifilm™ Plate Certificates, Recognitions and Validations

Recognition by Country *(cont.)*

3M Food Safety is certified to ISO 9001 for design and manufacturing

Chile

SAG (Chile Department of Agriculture)

Carcass sampling	<i>E. coli</i> /Coliform Count Plates	January, 2004
------------------	---------------------------------------	---------------

Colombia

IMVIMA

Aerobic Count Plates	Certificate No. 2006021775
Coliform Count Plates	Certificate No. 2006021761
<i>E. coli</i> /Coliform Count Plates	Certificate No. 2006021644
<i>Enterobacteriaceae</i> Count Plates	Certificate No. 2006021776
Staph Express System	Certificate No. 2006021784
Yeast and Mold Count Plates	Certificate No. 2006021773

El Salvador

Ministry of Public Health and Social Attendance Central Control Laboratory of Foods and Waters

Use in foods	Aerobic Count Plates, Coliform Count Plates, <i>E. coli</i> /Coliform Count Plates, <i>Enterobacteriaceae</i> Count Plates, Staph Express System, Yeast and Mold Count Plates	July, 2006
--------------	---	------------

France

AFNOR Certification (see International Validations)

3M™ Petrifilm™ Plate Certificates, Recognitions and Validations

Recognition by Country *(cont.)*

3M Food Safety is certified to ISO 9001 for design and manufacturing

Japan

Food Hygiene Manual

Foods	Aerobic Count Plates, Coliform Count Plates, <i>E. coli</i> /Coliform Count Plates, Rapid Coliform Count Plates, Staph Express System	July, 2004
-------	---	------------

Ministry of Health, Labour and Welfare

Carcass (cattle and swine) swab	<i>E. coli</i> /Coliform Count Plates	Notification No. 25
---------------------------------	---------------------------------------	---------------------

Korea

KCFR (Korea Code of Federal Regulatory) KFDA2004

All foods	Aerobic Count Plates	Method 7.8.2.2
	Coliform Count Plates	Method 7.8.5.4
	<i>E. coli</i> /Coliform Count Plates	Method 7.8.6.3

Mexico

Milk and dairy products	Aerobic Count Plates, Coliform Count Plates, <i>E. coli</i> /Coliform Count Plates, Staph Express System, Yeast and Mold Count Plates	NMX-F-717-COFOCA-LEC-2006
-------------------------	---	---------------------------

3M™ Petrifilm™ Plate Certificates, Recognitions and Validations

Recognition by Country *(cont.)*

3M Food Safety is certified to ISO 9001 for design and manufacturing

New Zealand

AgResearch — Mirinz Meat Industry Microbiological Methods, Edition Four, March 2005

Meat products	Aerobic Count Plates	Chapter 6—Section 6.8
	Staph Express System (for use with selected foods)	Chapter 7—Section 7.8.5
	<i>Enterobacteriaceae</i> Count Plates	Chapter 8—Section 8.2.5
	<i>E. coli</i> /Coliform Count Plates	Chapter 8—Section 8.4.5

New Zealand Food Safety Authority

Dairy produce and products	Aerobic Count Plates, Coliform Count Plates, <i>E. coli</i> /Coliform Count Plates, Staph Express System, Yeast and Mold Count Plates	Approved Methods Lists
----------------------------	---	------------------------

New Zealand Food Safety Authority

National Microbiological Database (farmed animals)	Aerobic Count Plates	Chapter 4—4.7.3
	<i>E. coli</i> /Coliform Count Plates	Chapter 4—4.8

Nordic Countries

NordVal Validation

All foods	<i>E. coli</i> /Coliform Count Plates	NordVal 014
-----------	---------------------------------------	-------------

Poland

PKN (Polish Normalisation Committee)

Raw milk and dairy products	3M Petrifilm Plates may be used as a method for: Enumeration of total aerobic microorganisms, Enumeration of coliform microorganisms, Enumeration of <i>Escherichia coli</i> microorganisms, Enumeration of yeast and mold	Commission No. 35 July 1, 1999
-----------------------------	--	--------------------------------

3M™ Petrifilm™ Plate Certificates, Recognitions and Validations

Recognition by Country *(cont.)*

3M Food Safety is certified to ISO 9001 for design and manufacturing

Republic of South Africa

Milk and dairy products	Aerobic Count Plates, Coliform Count Plates, <i>E. coli</i> /Coliform Count Plates	Government Gazette, No. R. 1555.21 of 21, November 1997
-------------------------	--	---

United Kingdom

Campden Food and Drink Research Association and Leatherhead Food Research Association study

- EMMAS assessment 3M Petrifilm *E. coli*/Coliform Count Plate-1998
- EMMAS assessment 3M Petrifilm *Enterobacteriaceae* Count Plate-2003
- CMMAS assessment 3M Petrifilm Staph Express System-2006
- CMMAS assessment 3M Petrifilm Yeast and Mould Count Plate-2006

United States

AOAC INTERNATIONAL (see International Recognition)

APHA (American Public Health Association)

Foods	Aerobic Count Plates, Coliform Count Plates, <i>E. coli</i> /Coliform Count Plates, <i>Enterobacteriaceae</i> Count Plates, High-Sensitivity Coliform Count Plates, Lactic Acid Bacteria Method, Rapid Coliform Count Plates, Yeast and Mold Count Plates	Compendium of Methods for the Microbiological Examination of Foods, 5 th Edition, 2001
Dairy	Aerobic Count Plates, Coliform Count Plates, <i>Enterobacteriaceae</i> Count Plates, <i>E. coli</i> /Coliform Count Plates, High-Sensitivity Coliform Count Plates, Rapid Coliform Count Plates, Yeast and Mold Count Plates	Standard Methods for the Examination of Dairy Products, 17 th Edition, 2004

USDA (United States Department of Agriculture) Agricultural Marketing Service

Laboratory Methods and Procedures	Aerobic Count Plates	Dairy Grading Branch DA Instruction
-----------------------------------	----------------------	-------------------------------------

3M™ Petrifilm™ Plate Certificates, Recognitions and Validations

Recognition by Country *(cont.)*

3M Food Safety is certified to ISO 9001 for design and manufacturing

United States		
USDA FSIS (Food Safety and Inspection Service)		
Beef, swine, sheep, goats, poultry, horses, mules and other equine carcass sampling	<i>E. coli</i> /Coliform Count Plates	Code of Federal Regulations, Title 9, Chapter III, Part 310.25 (9 CFR 310.25)
Poultry, ducks, geese and guinea carcass sampling	<i>E. coli</i> /Coliform Count Plates	(Code of Federal Regulations) 9 CFR Part 381.94
Examination of fresh, refrigerated and frozen prepared meat, poultry and pasteurized egg products	Aerobic Count Plates, <i>E. coli</i> /Coliform Count Plates, <i>Enterobacteriaceae</i> Count Plates	Microbiology Laboratory Guidebook, Chapter 3.01, Quantitative Analysis of Bacteria in Foods as Sanitary Indicators. January 20, 2011
US FDA (United States Food and Drug Administration)		
Foods	Aerobic Count Plates, Coliform Count Plates, <i>E. coli</i> /Coliform Count Plates	Code of Federal Regulations, Title 21, Part 2, Section 2.19 (21 CFR 2.19)
Milk	Aerobic Count Plates, Coliform Count Plates, High-Sensitivity Coliform Count Plates, Rapid Aerobic Count Plates, 3M Petrifilm Plate Reader	FDA Evaluation of Milk Laboratories, 2015 Revision
Venezuela		
Foods	<i>E. coli</i> /Coliform Count Plates	Covenin 3276-97
Dairy products and foods	Aerobic Count Plates	Covenin 3338-97
Dairy products	High-Sensitivity Coliform Count Plates	Covenin 3339-97

3M™ Petrifilm™ Plate Certificates, Recognitions and Validations

Recognition by Country *(cont.)*

3M Food Safety is certified to ISO 9001 for design and manufacturing

Vietnam

Vietnam Food Administrator permits 3M Petrifilm Plates into circulation

Foods	Aerobic Count Plates	01/2009/YT-CNDK
	Yeast and Mold Count Plates	02/2009/YT-CNDK
	Environmental Listeria Plates	03/2009/YT-CNDK
	<i>E. coli</i> /Coliform Count Plates	04/2009/YT-CNDK
	Rapid Coliform Count Plates	05/2009/YT-CNDK
	Staph Express System	06/2009/YT-CNDK
	Coliform Count Plates	07/2009/YT-CNDK
	High-Sensitivity Coliform Plates	08/2009/YT-CNDK
	<i>Enterobacteriaceae</i> Count Plates	09/2009/YT-CNDK

Tiêu chu n Việt Nam (TCVN) issued by the Vietnam Standard and Quality Institute

Foods	<i>E. coli</i> /Coliform Count Plates	TCVN 9975:2013 based on AOAC OMA 991.14
	Aerobic Count Plates	TCVN 9977:2013 based on AOAC OMA 990.12
	<i>Enterobacteriaceae</i> Count Plates	TCVN 9980:2013 based on AOAC OMA 2003.01
	Yeast and Mold Count Plates	TCVN 7852:2013 based on AOAC OMA 997.02
Meats and seafood	<i>E. coli</i> Count Plates	TCVN 9976:2013 based on AOAC OMA 998.08
Dairy products	Aerobic Count Plate, Coliform Count Plates	TCVN 9978:2013 based on AOAC OMA 989.10
Milk	Aerobic Count Plate, Coliform Count Plates	TCVN 9979:2013 based on AOAC OMA 986.33

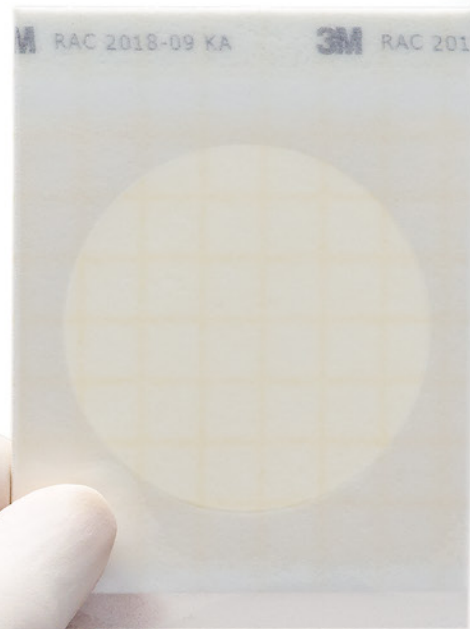
3M | Petrifilm™



3M™ Petrifilm™ Plates and Plate Reader

**Fresh science
for the modern lab.**

Made for today's food science.



3M™ Petrifilm™ Plates

The global food safety landscape is continuously changing. Are you keeping up? Unlike traditional agar methods, 3M™ Petrifilm™ Plates are ready to use — no prep required. Each slim pack offers consistent, uniform testing media. Just open it up and get right to work. Find new freedom with time to focus on what's really important: quality and efficiency. It's time to take a fresh look at food safety.

- ▶ Ready to use — reduce or eliminate time-consuming agar prep
- ▶ Proven testing methods for consistent, reliable results
- ▶ Compact size uses less storage/incubator space

Ready, fast, easy.

Modern food testing in three simple steps.

1. Inoculate

Eliminate media prep — plates are ready to inoculate.

2. Incubate

A compact incubator is all you need.

3. Interpret

Indicator dyes facilitate colony counting.

3M™ Petrifilm™ Plate Reader

By automatically reading and counting six widely used 3M Petrifilm Plates, this compact instrument can help you improve plate count accuracy, consistency and speed, while raising your lab's productivity and reducing costs.

- ▶ Fast results (4 seconds/plate)
- ▶ Reduces the chance for human error
- ▶ Software automatically calculates counts and manages data

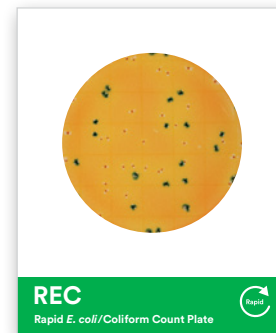
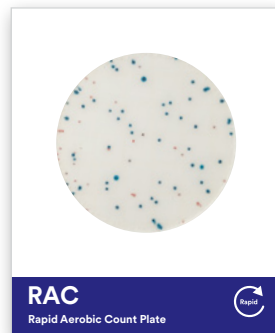




Reliable consistency. Rapid results.

3M Petrifilm Rapid Plate Portfolio*

These easy-to-use plates with enhanced features can produce results faster than traditional methods, so you can confidently make time-sensitive decisions.



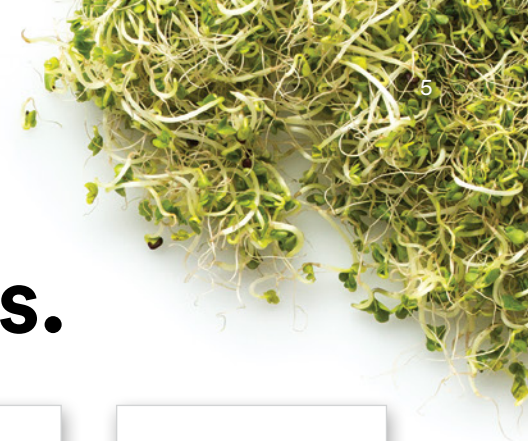
Benefits to your business¹:

↓ **85%**
less space
than agar

↓ **45%**
reduced
labor costs

↑ **80%**
increased
technician
efficiency

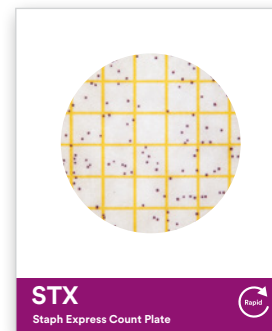
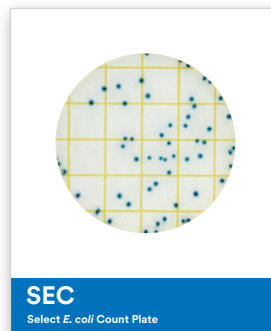
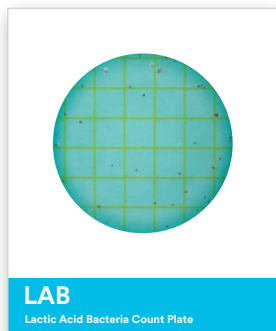
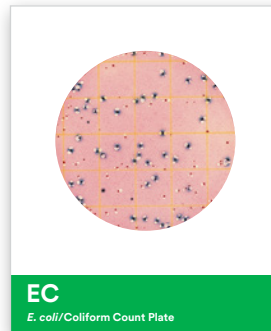
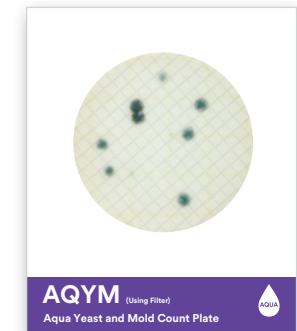
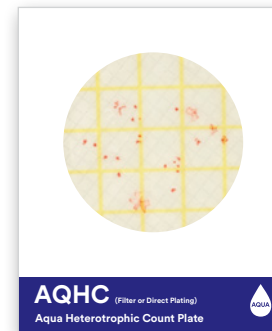
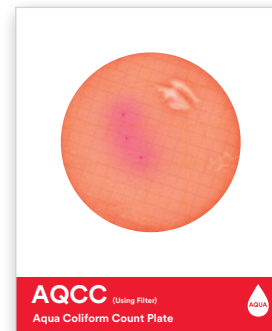
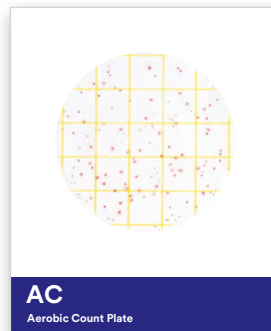
↓ Data in
1/2
the time



Microbial testing with fresh choices.

3M Petrifilm Standard Plate Portfolio*

Our portfolio of products is constantly under development to provide the plates you need for the testing your lab does every day.



*Product naming information on plate images is for illustration purposes only.

†Data on file.



Get sustainable science.

The future is green — make sure your lab is, too, with 3M Petrifilm Plates, a significantly more sustainable alternative to traditional agar methods.

3M Petrifilm Plates vs. agar methods²:



↓ **80%**
less water



↓ **75%**
less energy



↓ **66%**
less waste



↓ **75%**
less greenhouse
gas emissions

²Reduction in Primary Energy Demand, Blue Water Consumption and Greenhouse Gas Emissions from 3M Petrifilm Plates Compared to Traditional Microbiological Analysis Method,” Jason Howland, 3M Environmental Laboratory and Hannah Bakken, 3M Food Safety.

Backed by experts.

When public health is on the line, you need testing you can trust. 3M Petrifilm Plates are created and inspected by a team of 3M scientists and engineers, and are validated by international organizations like AOAC International and AFNOR Certification. We've distilled the complexity, variability and manual labor of microbial testing into a simple, reliable and consistent method.

Certifications and validations*:

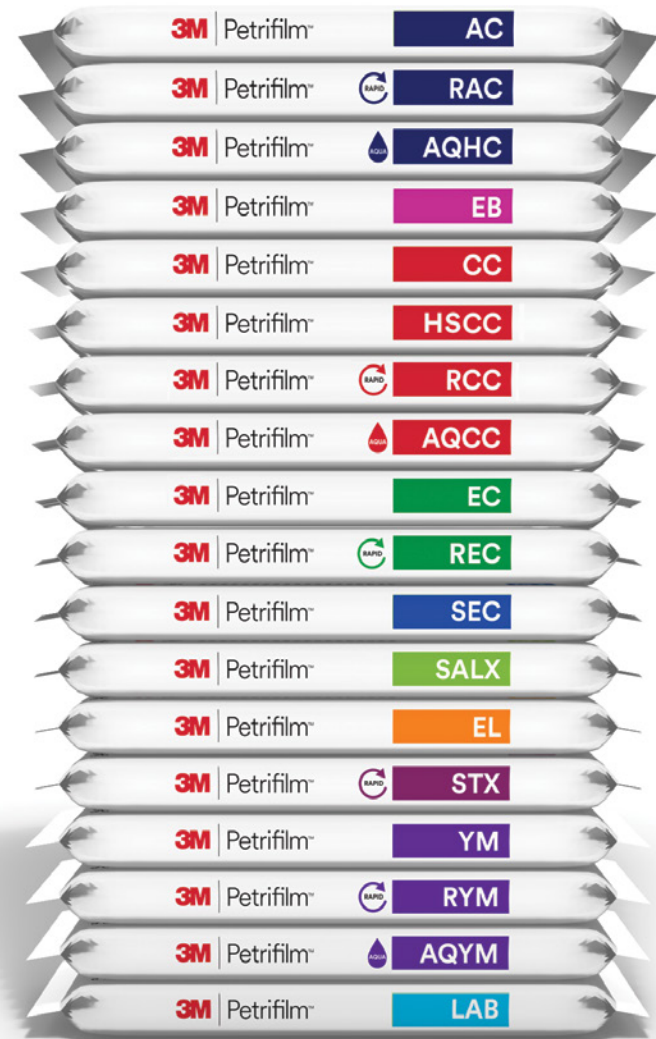
- ▶ AOAC® *Official Methods of Analysis*SM
- ▶ AOAC® *Performance Tested Methods*SM
- ▶ NF VALIDATION by AFNOR Certification
- ▶ Numerous regional and local approvals

*Validations may vary by plate and region.



No prep. No clutter. No kidding.

In the modern lab, space is at a premium. 3M Petrifilm Plates eliminate the need to store bulky agar dishes or instruments — each slim pack is less than an inch thick. It's the convenient, efficient, space-saving way to test in the modern food system.





Petrifilm™

Interpretation Guide

The 3M™ Petrifilm™ *E. coli*/Coliform Count Plate is a sample-ready-culture medium system which contains modified Violet Red Bile (VRB) nutrients, a cold-water-soluble gelling agent, an indicator of glucuronidase activity, 5-bromo-4-chloro-3-indolyl-D-glucuronide (BCIG), and a tetrazolium indicator that facilitates colony enumeration. 3M Petrifilm *E. coli*/Coliform Count Plates are used for the enumeration of *Escherichia coli* (*E. coli*) and coliforms in the food and beverage industries.



EC

E. coli/Coliform Count Plate

The United States Food and Drug Administration (FDA) Bacteriological Analytical Manual (BAM) define coliforms as Gram negative rods, which produce acid and gas from lactose fermentation.

Most *E. coli* (about 97%) produce beta-glucuronidase which produces a blue precipitate associated with the colony indicated by the blue to red-blue colonies. The top film traps gas produced by the lactose fermenting coliforms and *E. coli*. About 95% of *E. coli* produce gas, as indicated by colonies associated with entrapped gas (within approximately one colony diameter). Blue colonies without gas are not counted as *E. coli*.^{*} Other coliform colonies are red and closely associated with entrapped gas. The total coliform count consists of both the red and blue colonies associated with gas.^{*}

Most *E. coli* O157 strains are atypical, for example they are glucuronidase negative; they will not produce a blue color, and will not be detected on 3M Petrifilm *E. coli*/Coliform Count Plates.

^{*}Validated through AOAC® *Official Methods of Analysis*SM program. The definition of *E. coli* and coliform varies by regional method. In particular, the confirmation of *E. coli* may vary by country.

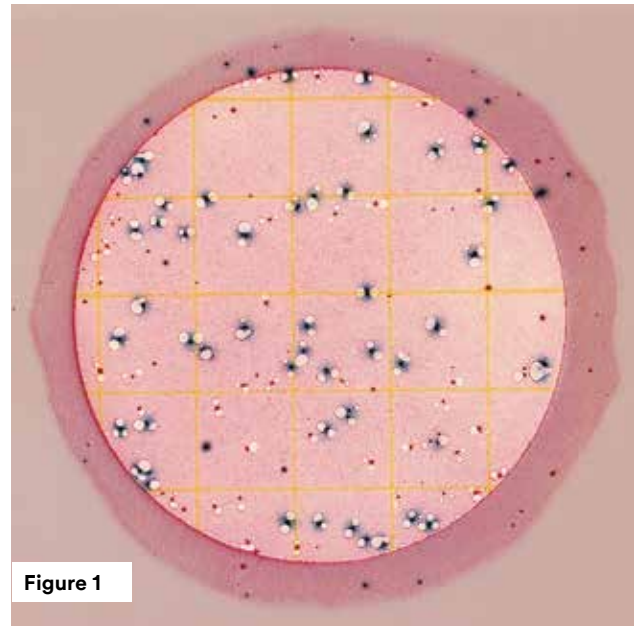
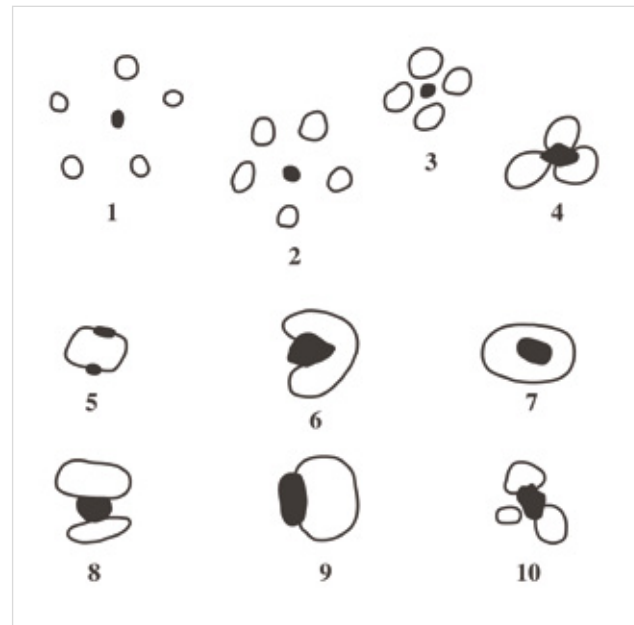


Figure 1

***E. coli* count = 49 (blue colonies with gas)**

Total coliform count = 87 (red and blue colonies with gas)

All figures have been counted according to AOAC® *Official Methods of Analysis*SM #998.08 and #991.14. The confirmation of *E. coli* may vary by country.



Bubbles

The illustrations above show examples of various bubble patterns associated with gas producing colonies. All should be enumerated.

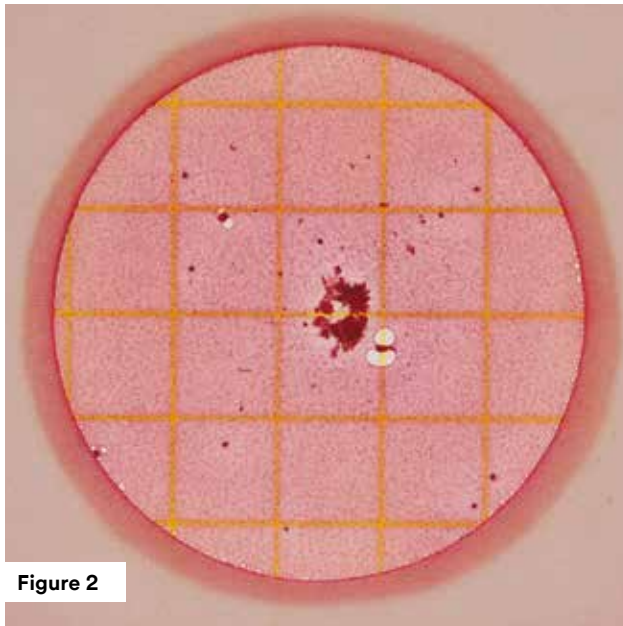


Figure 2

Total coliform count = 3 (red colonies with gas)

Food particles are irregularly shaped and are not associated with gas bubbles.

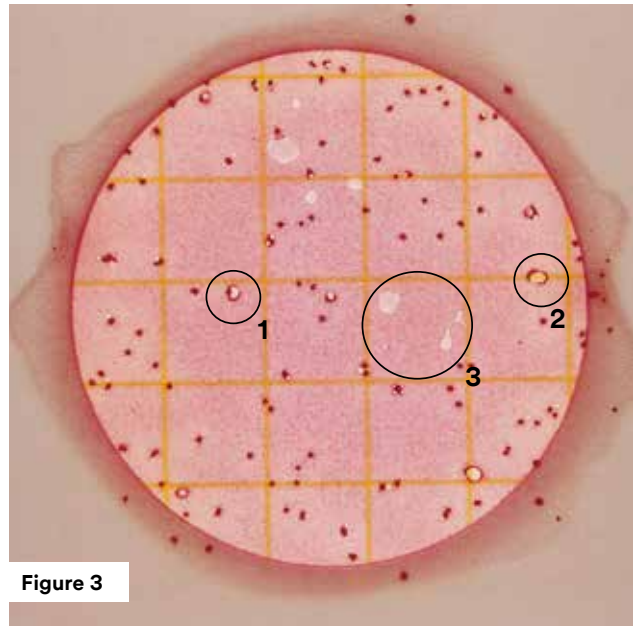


Figure 3

Estimated total coliform count = 150

The recommended counting limit on a 3M Petrifilm *E. coli*/Coliform Count Plate is 150 colonies.

Bubble patterns may vary. Gas may disrupt the colony so that the colony "outlines" the bubble. See Circles 1 and 2. Artifact bubbles may result from improper inoculation or from trapped air within the sample. They are irregularly shaped and are not associated with a colony. See Circle 3.

For a more accurate count, further dilution of the sample may be necessary.

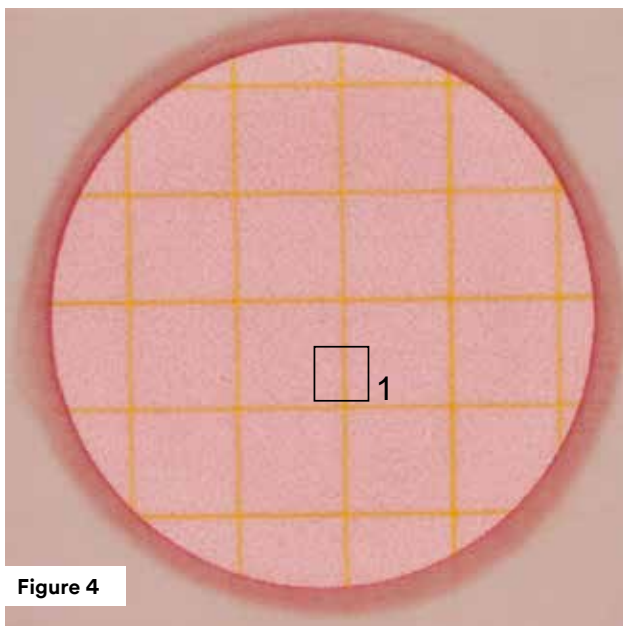


Figure 4

No growth = 0

Notice the changes in gel color in Figures 4 through 10. As the *E. coli* or coliform count increases, the color of the gel turns to dark red or purple-blue. Background bubbles are a characteristic of the gel and are not a result of *E. coli* or coliform growth. See Square 1.

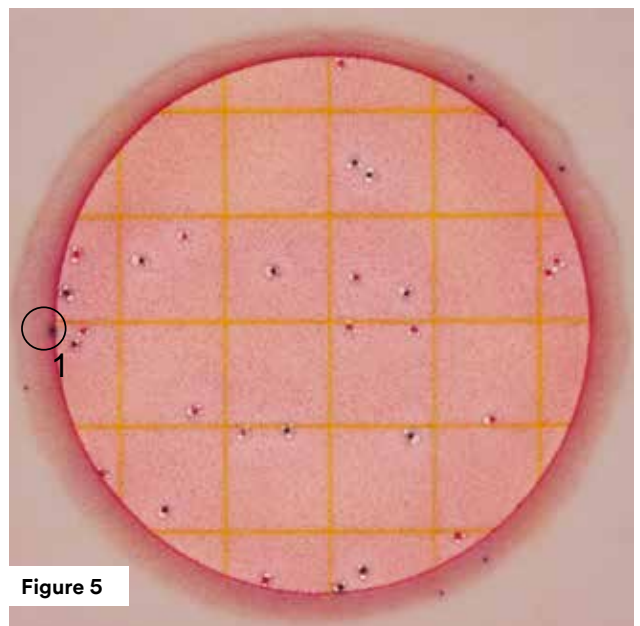


Figure 5

***E. coli* count = 13 (blue colonies with gas)**

Total coliform count = 28 (red and blue colonies with gas)

Do not count colonies that appear on the foam barrier because they are removed from the selective influence of the medium. See Circle 1.



Figure 6a

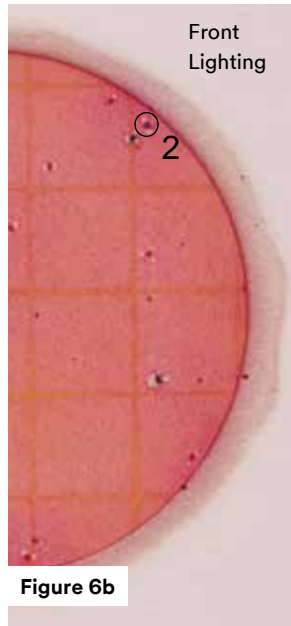


Figure 6b

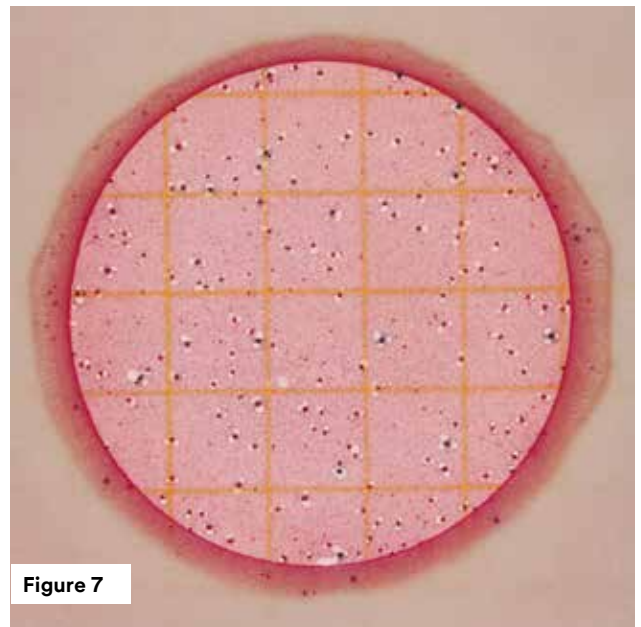


Figure 7

***E. coli* count = 3 (blue colonies with gas)**

Any blue in a colony (blue to red-blue) with gas indicates the presence of *E. coli*. Front lighting may enhance the detection of blue precipitate formed by a colony. Circle 1 shows a red-blue colony counted using back lighting. Circle 2 shows the same colony with front lighting. The blue precipitate is more evident in Circle 2.

Estimated *E. coli* = 17 (blue colonies with gas)

Estimated total coliform count = 150

The circular growth area is approximately 20cm². Estimates can be made on plates containing greater than 150 colonies by counting the number of colonies in one or more representative squares and determining the average number per square. Multiply the average number by 20 to determine the estimated count per plate.

For a more accurate count, further dilution of the sample may be necessary.

Too Numerous to Count (TNTC)

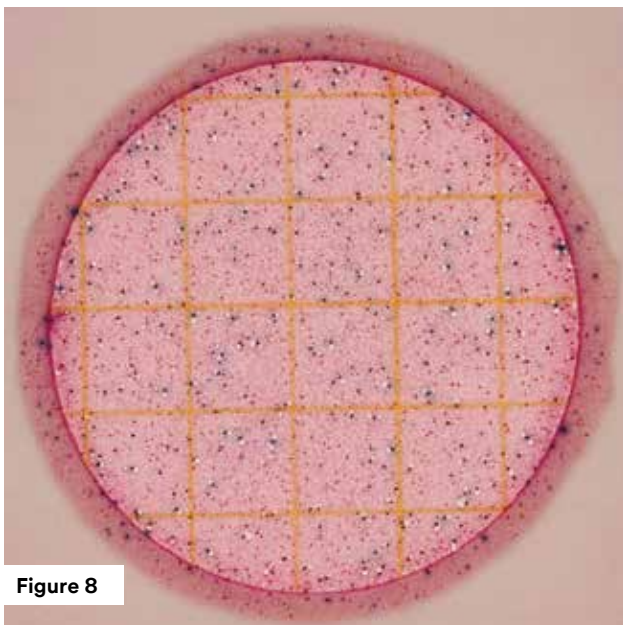


Figure 8

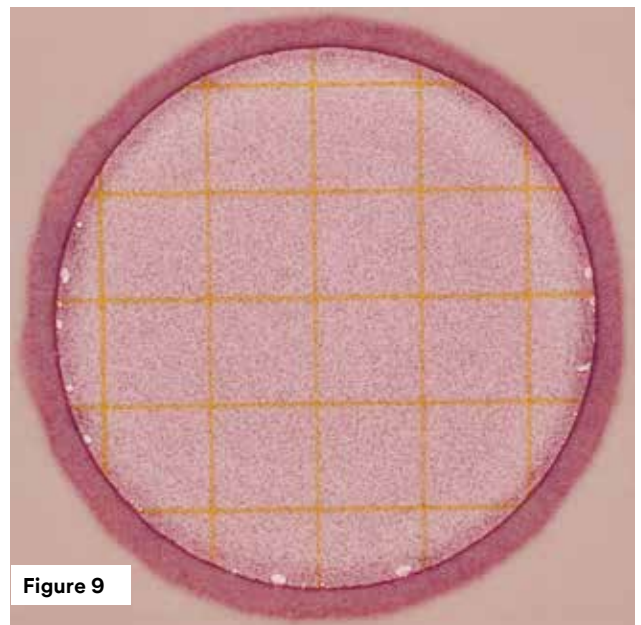


Figure 9

Total coliform count = TNTC

3M Petrifilm *E. coli*/Coliform Count Plates with colonies that are too numerous to count (TNTC) have one or more of the following characteristics: many small colonies, many gas bubbles and a deepening of the gel color from red to purple-blue.

For a more accurate count, further dilution of the sample may be necessary.

Total coliform count = TNTC

High concentrations of *E. coli* may cause the growth area to turn purple-blue.

For a more accurate count, further dilution of the sample may be necessary.

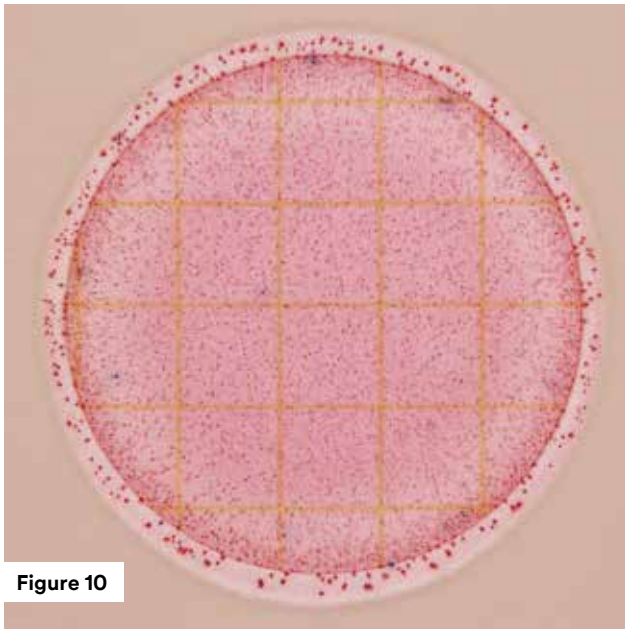


Figure 10

Total coliform count = TNTC

High concentration of coliforms may cause a deepening of the gel color and many small, indistinct colonies.

For a more accurate count, further dilution of the sample may be necessary.

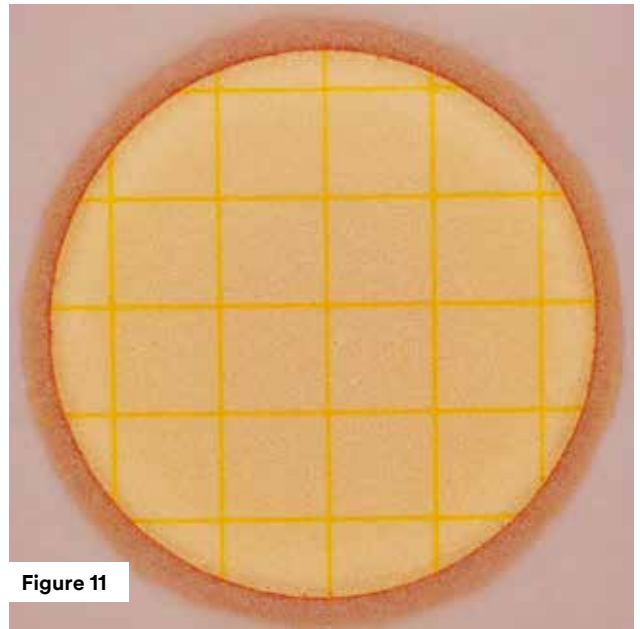


Figure 11

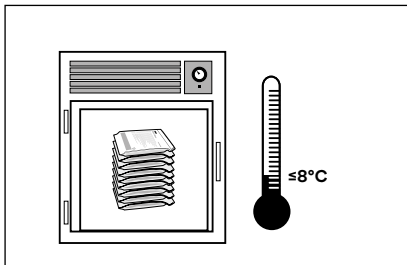
Total coliform count = TNTC

When high numbers of non-coliform organisms such as *Pseudomonas* are present on 3M Petrifilm *E. coli*/Coliform Count Plates, the gel may turn yellow.

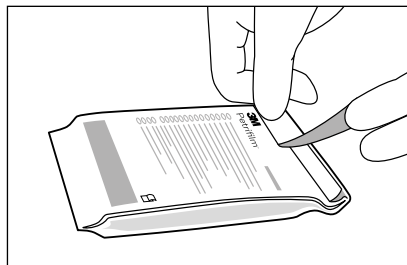
For a more accurate count, further dilution of the sample may be necessary.

Reminders for Use

Storage

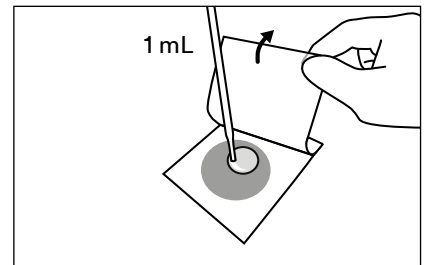


- 1 Store the unopened pouches of plates at frozen or refrigerated temperatures $\leq 8^{\circ}\text{C}$ ($\leq 46^{\circ}\text{F}$). Use before expiration date on package. It is best to allow pouches to reach room temperature before opening.

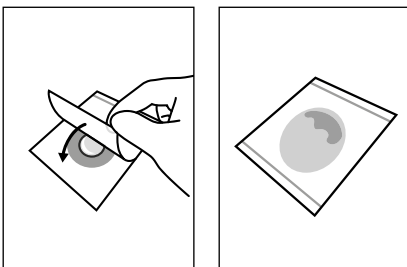


- 2 Seal by folding the end of the pouch over and applying adhesive tape. **To prevent exposure to moisture, do not refrigerate opened pouches.** Store sealed pouches in a cool dry place for no longer than four weeks.

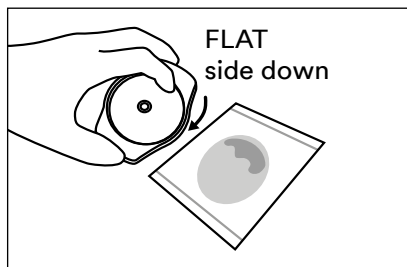
Inoculation



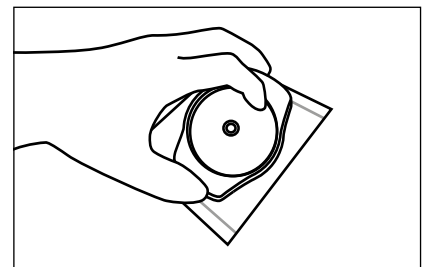
- 3 Place 3M Petrifilm *E. coli*/Coliform Count Plate on flat, level surface. Lift the top film and with a 3M™ Electronic Pipettor or equivalent held perpendicular to plate, dispense 1 mL of sample suspension onto center of bottom film.



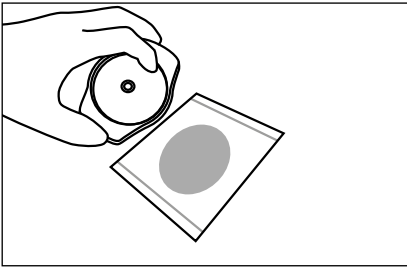
- 4 Roll the top film down onto sample gently to prevent pushing sample off film and to avoid entrapping air bubbles. Do not let top film drop.



- 5 With flat side down, place 3M™ Petrifilm™ Spreader on the center of the 3M Petrifilm *E. coli*/Coliform Count Plate.

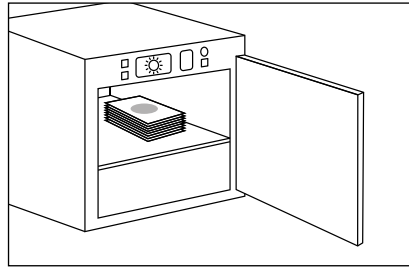


- 6 Press firmly on the center of the spreader to distribute the sample evenly. Spread the inoculum over the growth area before the gel is formed. Do not slide the spreader across the top film.



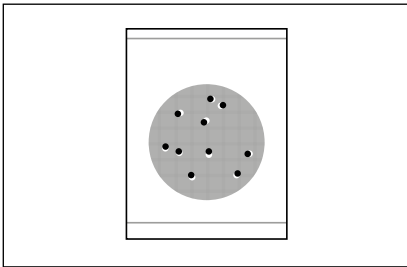
7 Remove the spreader and leave the plate undisturbed for one minute to permit the gel to form.

Incubation



8 Incubate 3M Petrifilm *E. coli*/Coliform Count Plates with clear side up in stacks of up to 20. It may be necessary to humidify incubator to minimize moisture loss. **Please refer to the product instructions for third party validated methods.**

Interpretation



9 3M Petrifilm *E. coli*/Coliform Count Plates can be counted using the 3M™ Petrifilm™ Plate Reader, on a standard colony counter or other illuminated magnifier. Colonies may be isolated for further identification. Lift top film and pick the colony from the gel.

Use Appropriate Sterile Diluents

Butterfield's phosphate buffered dilution water, 0.1% peptone water, peptone salt diluent, quarter-strength Ringer's solution, saline solution (0.85-0.90%), bisulfite-free letheen broth or distilled water.

For optimal growth and recovery of the microorganisms, adjust the pH of the sample suspension to 6.6-7.2.

Do not use diluents containing citrate, bisulfite or thiosulfate with the 3M Petrifilm *E. coli*/Coliform Plates, they can inhibit growth.

If citrate buffer is indicated in the standard procedure, substitute with one of the buffers listed above, warmed to 40-45°C.