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 *E. coli* 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	*Enterobacteriaceae* 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℠*

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, *E. coli*/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	*E. coli*/Coliform Count Plates	Method 998.08
	Enterobacteriaceae Count Plates	Method 2003.01
	Salmonella 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 Method℠*		
Environmental sampling	Environmental *Listeria* Plates	Certificate Number 030601
Bottled water	Aqua Coliform Count Plates	Certificate Number 091101
Variety of Foods	*Salmonella* 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 *E. coli*/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	*E. coli*/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

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 *E. coli* Count Plates, *Enterobacteriaceae* 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	*E. coli*/Coliform Count Plates	IN 40, 2005
Canada		
Health Protection Branch, Compendium of Analytical Methods		
Laboratory procedures	Aerobic Count Plates, Coliform Count Plates, *E. coli*/Coliform Count Plates, Yeast and Mold Count Plates	Method MFLP-41
Environmental sampling	High-Sensitivity Coliform Count Plates	Method MFLP-41B
	Environmental *Listeria* 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
	E. coli/Coliform Count Plates	Method MFHPB-34
	Yeast and Mold Count Plates	Method MFHPB-32

Recognition by Country *(cont.)*

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

Chile

SAG (Chile Department of Agriculture)		
Carcass sampling	*E. coli*/Coliform Count Plates	January, 2004

Colombia

IMVIMA		
	Aerobic Count Plates	Certificate No. 2006021775
	Coliform Count Plates	Certificate No. 2006021761
	E. coli/Coliform Count Plates	Certificate No. 2006021644
	Enterobacteriaceae 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, *E. coli*/Coliform Count Plates, *Enterobacteriacea* Count Plates, Staph Express System, Yeast and Mold Count Plates	July, 2006

France

AFNOR Certification (see International 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, *E. coli*/Coliform Count Plates, Rapid Coliform Count Plates, Staph Express System	July, 2004
Ministry of Health, Labour and Welfare		
Carcass (cattle and swine) swab	*E. coli*/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
	E. coli/Coliform Count Plates	Method 7.8.6.3
Mexico		
Milk and dairy products	Aerobic Count Plates, Coliform Count Plates, *E. coli*/Coliform Count Plates, Staph Express System, Yeast and Mold Count Plates	NMX-F-717-COFOCA-LEC-2006

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
	Enterobacteriaceae Count Plates	Chapter 8—Section 8.2.5
	E. coli/Coliform Count Plates	Chapter 8—Section 8.4.5
New Zealand Food Safety Authority		
Dairy produce and products	Aerobic Count Plates, Coliform Count Plates, *E. coli*/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
	E. coli/Coliform Count Plates	Chapter 4—4.8

Nordic Countries

NordVal Validation		
All foods	*E. coli*/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 *Escherichia coli* 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, *E. coli*/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, *E. coli*/Coliform Count Plates, *Enterobacteriaceae* 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, 5th Edition, 2001
Dairy	Aerobic Count Plates, Coliform Count Plates, *Enterobacteriaceae* Count Plates, *E. coli*/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, 17th 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	*E. coli*/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	*E. coli*/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, *E. coli*/Coliform Count Plates, *Enterobacteriaceae* 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, *E. coli*/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	*E. coli*/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

Recognition by Country *(cont.)*

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

Vietnam

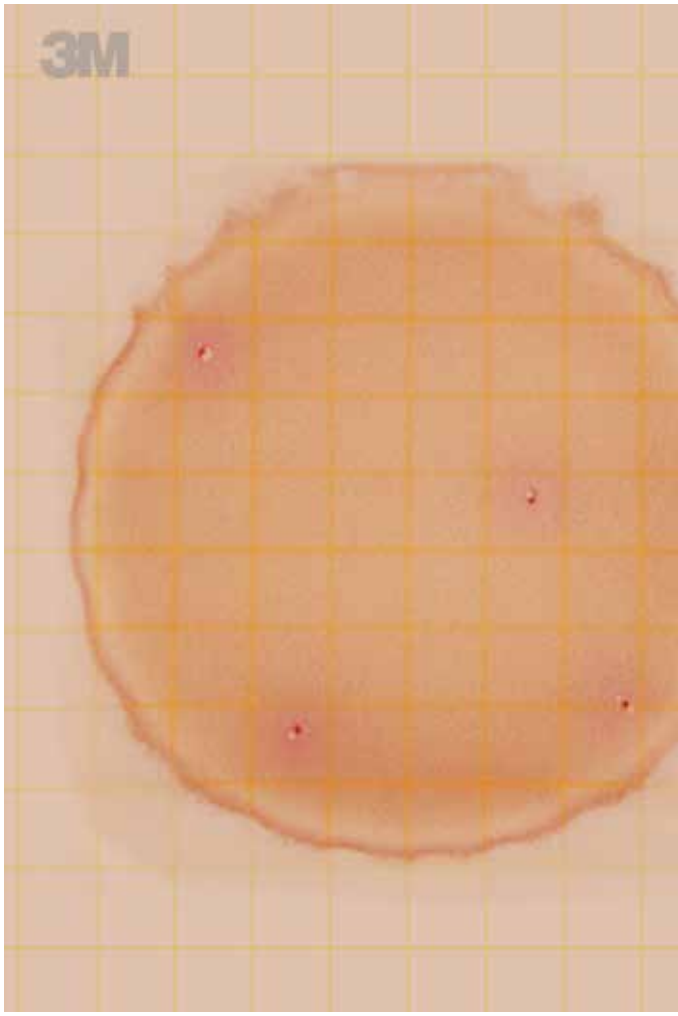
Vietnam Food Administrator permits 3M Petrifilm Plates into circulation		
Foods	Aerobic Count Plates	01/2009/YT-CNDK
	Yeast and Mold Count Plates	02/2009/YT-CNDK
	Environmental Listeria Plates	03/2009/YT-CNDK
	E. coli/Coliform Count Plates	04/2009/YT-CNDK
	Rapid Coliform Count Plates	05/2009/YT-CNDK
	Staph Express System	062009/YT-CNDK
	Coliform Count Plates	07/2009/YT-CNDK
	High-Sensitivity Coliform Plates	08/2009/YT-CNDK
	Enterobacteriaceae Count Plates	09/2009/YT-CNDK
Tiêu chu n Việt Nam (TCVN) issued by the Vietnam Standard and Quality Institute		
Foods	*E. coli*/Coliform Count Plates	TCVN 9975:2013 based on AOAC OMA 991.14
	Aerobic Count Plates	TCVN 9977:2013 based on AOAC OMA 990.12
	Enterobacteriaceae 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	*E. coli* 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™

Interpretation Guide

The 3M™ Petrifilm™ High-Sensitivity Coliform Count Plate is a sample-ready-culture medium system which contains modified Violet Red Bile (VRB) nutrients, cold-water-soluble gelling agent, and a tetrazolium indicator that facilitates colony enumeration.



HSCC

High-Sensitivity Coliform Count Plate

The United States Food and Drug Administration (FDA) Bacteriological Analytical Manual (BAM) defines coliforms as Gram-negative rods which produce acid and gas from lactose during fermentation. Gas production is used to differentiate coliform from non-coliform colonies. Gas trapped around red colonies indicates coliforms on the 3M™ Petrifilm™ High-Sensitivity Coliform Count Plate. Acid production causes the pH indicator to deepen the gel color to a more pink-red background color.

ISO defines coliforms by their ability to grow in method-specific, selective media. ISO method 4831, enumerating coliforms by the most probable number (MPN) method, defines coliforms by their ability to grow and produce gas in the conditions described in the standard. On the 3M Petrifilm High-Sensitivity Coliform Count Plate, these coliforms are indicated by red colonies with gas.

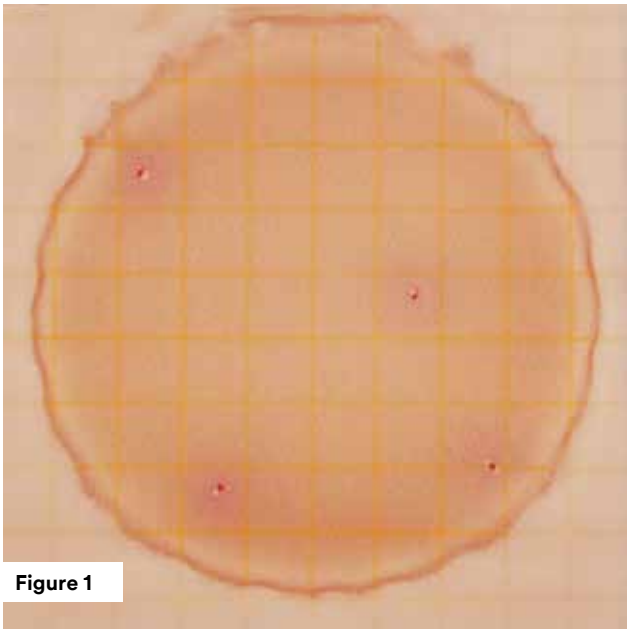


Figure 1

Coliform count = 4

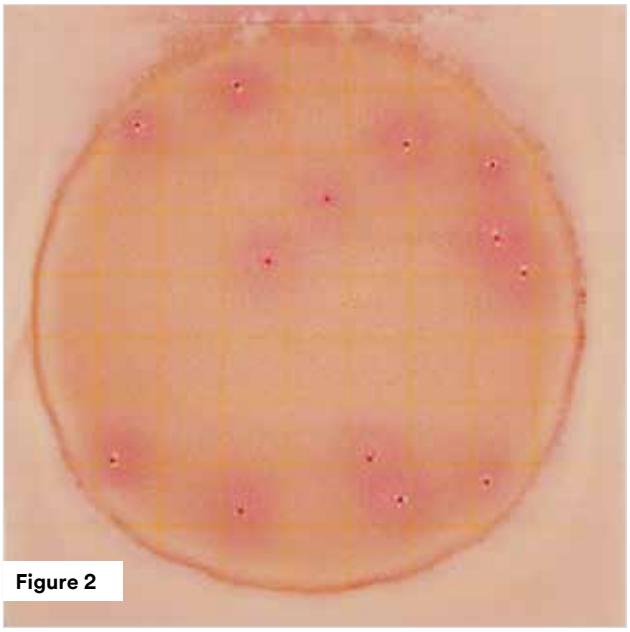


Figure 2

Coliform count = 13

It is easy to count coliform colonies on 3M Petrifilm High-Sensitivity Coliform Count Plates. A red indicator dye in the plate colors Gram-negative colonies and the top film traps gas produced by the coliforms.

When coliforms produce acid, the gel surrounding the colony becomes pinker, as shown in Figure 2.

Look for pink-red zones around the colony to aid in counting. Count red colonies that are associated with gas bubbles as coliforms.

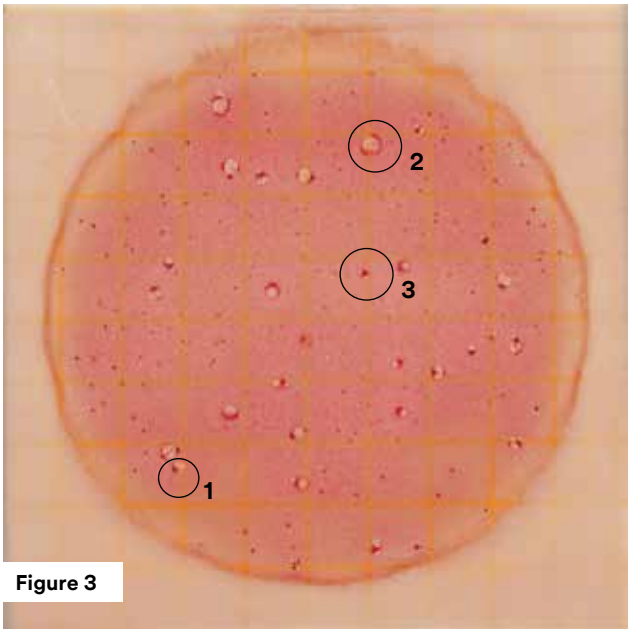


Figure 3

Coliform count = 30

Gas production is used to differentiate coliform from non-coliform colonies. Circles 1, 2 and 3 show how bubble patterns may vary. The gas bubble in Circle 1 is adjacent to the colony. In Circle 2, the gas disrupts the coliform colony so that the colony "outlines" the bubble. In Circle 3, three small gas bubbles circle the colony. All of these examples are coliforms. Red colonies which are not associated with gas bubbles should not be counted as coliforms.

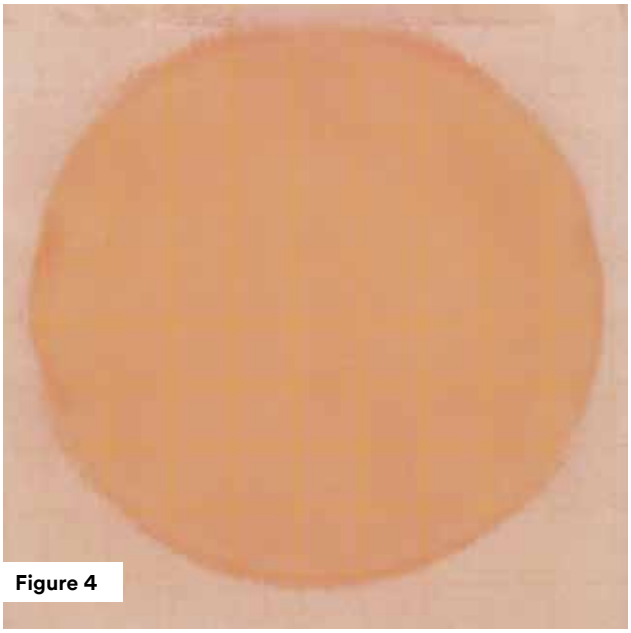


Figure 4

Coliform count = 0

Notice the change in gel color in Figures 4 through 9. As the coliform count and acid production increases, the color of the gel deepens from a light orange in Figure 4 to a bright pink-red in Figure 9. Plating and incubating a negative control will aid in differentiating changes in gel color.

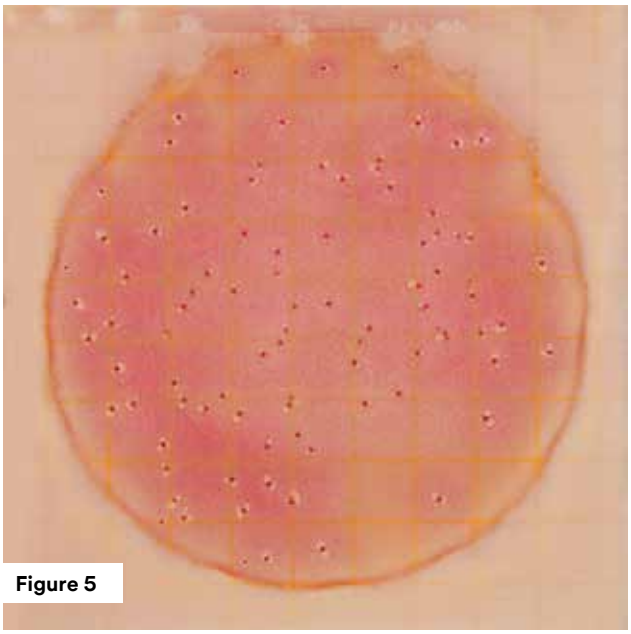


Figure 5

Coliform count = 90

The countable range on 3M Petrifilm High-Sensitivity Coliform Count Plate is less than or equal to 150 colonies.

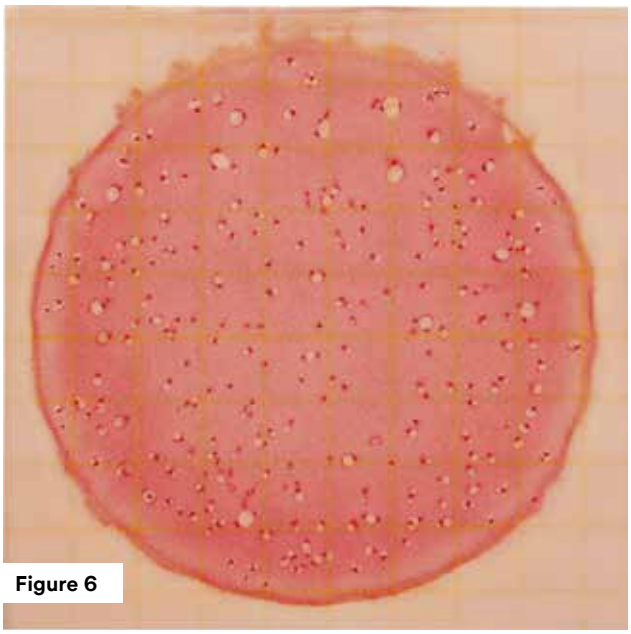


Figure 6

Estimated coliform count = 320

The circular growth area is approximately 60 cm^2. 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 60 to determine the estimated count per plate.

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

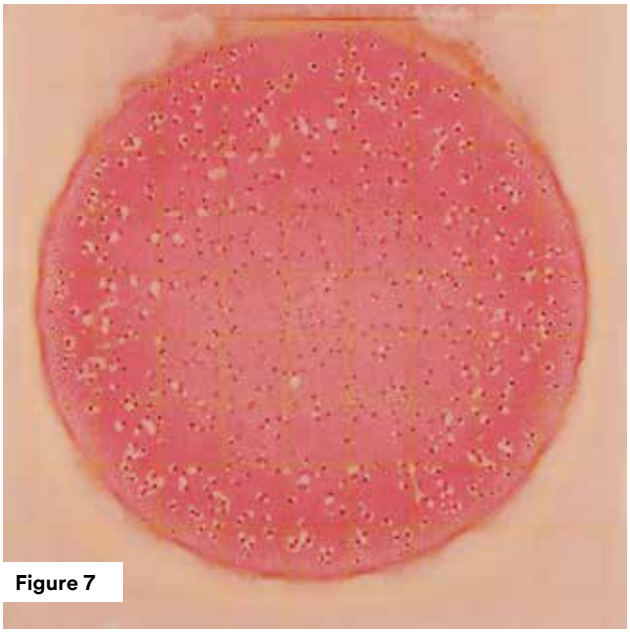


Figure 7

Estimated coliform count = 840

Colonies and gas bubbles may be smaller around the edge of the inoculated area, as noted in Figure 7. The different gel appearance around the edge of the inoculum does not affect colony counts.

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

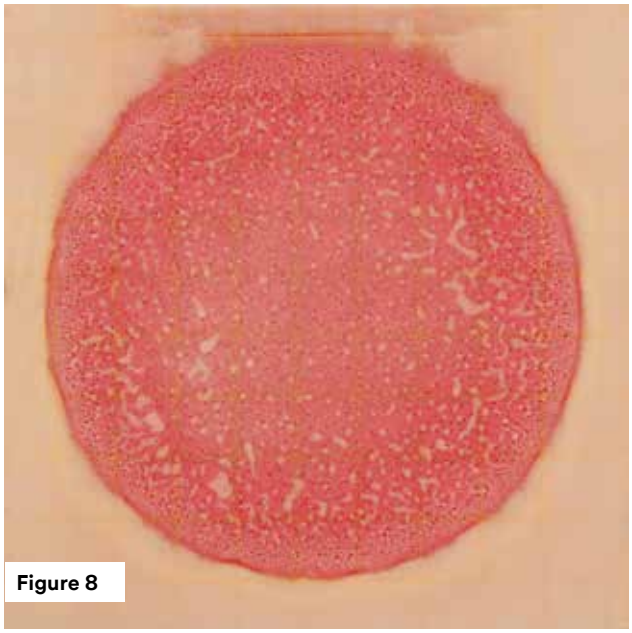


Figure 8

Coliform count = too numerous to count (TNTC)

A TNTC coliform count will cause the gel to turn a darker pink-red color. Additionally, one may observe many small colonies and/or many gas bubbles. The higher the count the less prominent the gas and colonies may be. All three characteristics are shown in Figure 8.

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

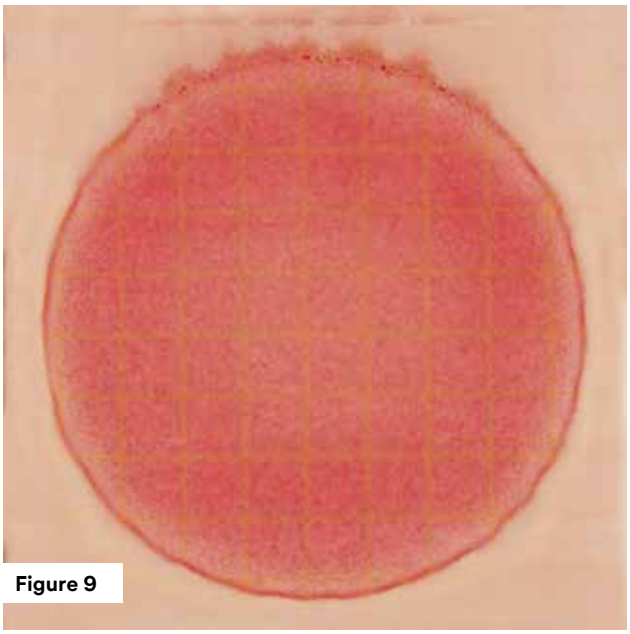


Figure 9

Coliform count = TNTC

Figure 9 shows many small colonies and a deepening of the gel color.

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

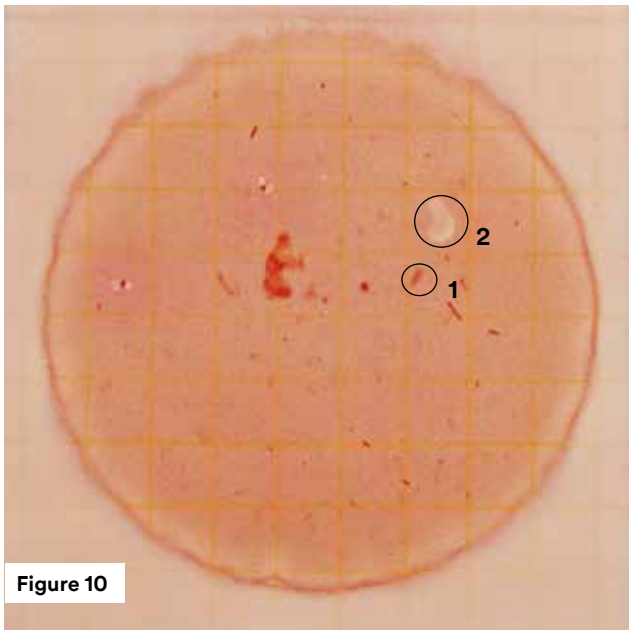


Figure 10

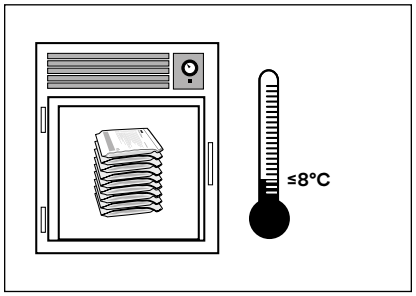
Coliform count = 2

Food particles often are irregularly shaped and are not associated with gas bubbles. See Circle 1.

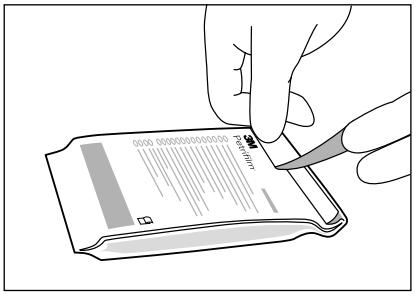
Artifact bubbles may result from improper inoculation of the 3M Petrifilm High-Sensitivity Coliform Count Plate. They are irregularly shaped and not associated with a red colony. See Circle 2.

Reminders for Use

Storage



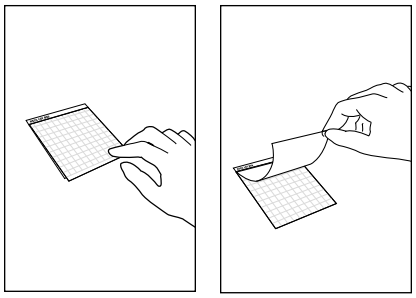
1. Store unopened 3M Petrifilm High-Sensitivity Coliform Count Plate pouches frozen or refrigerated at temperatures ≤8°C (≤46°F). Use before expiration date on package. Just prior to use, allow unopened pouches to come to room temperatures before opening. Return unused plates to pouch.



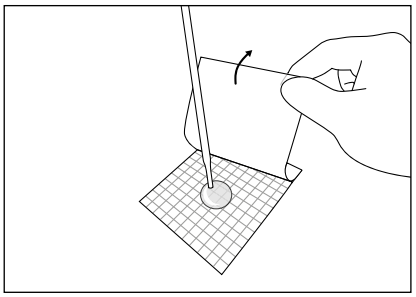
2. Seal by folding the end of the pouch over and applying adhesive tape. **To prevent exposure to moisture, do not refrigerate opened pouches.** Store resealed pouches in a cool dry place for no longer than four weeks.

Inoculation

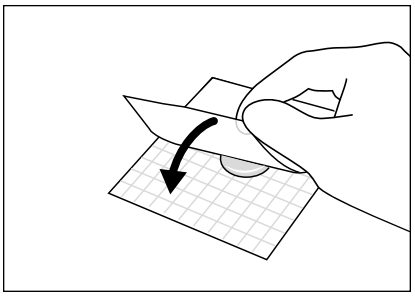
Remember to inoculate and spread each 3M Petrifilm Plate before going on to the next plate.



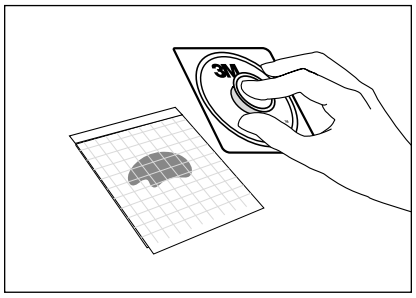
3. Place the 3M Petrifilm High-Sensitivity Coliform Count Plate on flat, level surface. Lift top film.



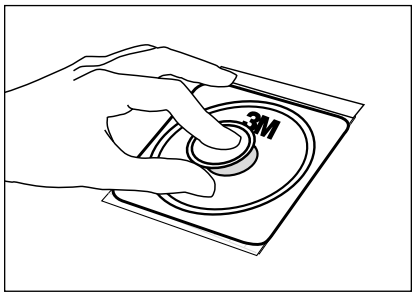
4. With 3M™ Electronic Pipettor or equivalent perpendicular to plate, place 5 mL of sample suspension onto center of bottom film.



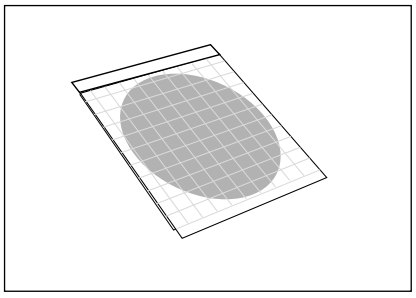
5. Roll top film down onto sample gently to prevent pushing sample off film and to avoid entrapping air bubbles. Do not let top film drop.



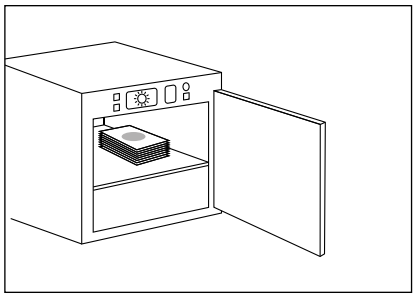
6. Place the 3M™ Petrifilm™ High-Sensitivity Plate Spreader on top film over inoculum.



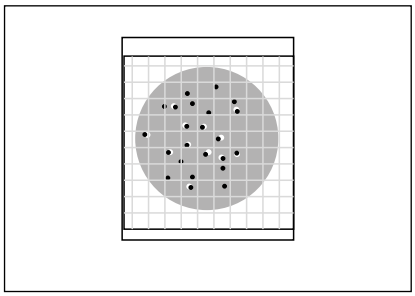
7. Distribute sample with a gentle downward pressure on the handle of the spreader. Do not twist or slide the spreader.



8. Lift spreader. Wait 2-5 minutes for gel to form.



9 Incubate plates with clear side up in stacks of up to 10. It may be necessary to humidify incubator to minimize moisture loss. **See product instructions for third party validated methods.**



10 3M Petrifilm High-Sensitivity Coliform Count Plates can be counted 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, dipotassium hydrogen phosphate, 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 6.5-7.5.

Do not use buffers containing citrate, bisulfite or thiosulfate; 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.

Our website offers you a wide variety of tapes at affordable prices.