

3M™ Petrifilm™ E. coli/Coliform Interpretation Guide



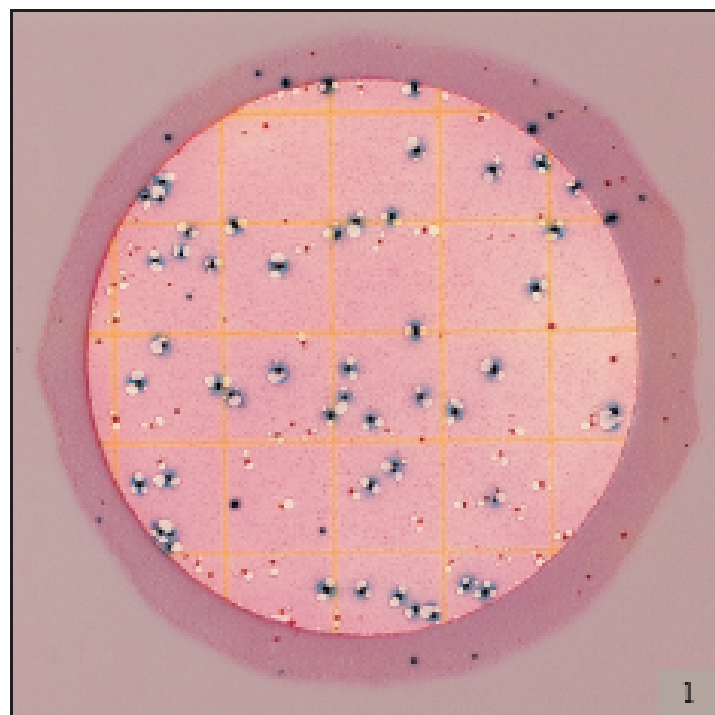
Interpretation Guide

Petrifilm™ E. coli/Coliform Count Plate

This guide familiarizes you with results on 3M™ Petrifilm™ E. coli/Coliform Count plates. For more information, contact the official 3M Microbiology Products representative nearest you.

Petrifilm E. coli/Coliform Count (EC) plates contain Violet Red Bile (VRB) nutrients, a cold-water-soluble gelling agent, an indicator of glucuronidase activity, and an indicator that facilitates colony enumeration. Most *E. coli* (about 97%) produce beta-glucuronidase which produces a blue precipitate associated with the colony. The top film traps gas produced by the lactose fermenting coliforms and *E. coli*. About 95% of *E. coli* produce gas, indicated by blue to red-blue colonies associated with entrapped gas on the Petrifilm EC plate (within approximately one colony diameter).

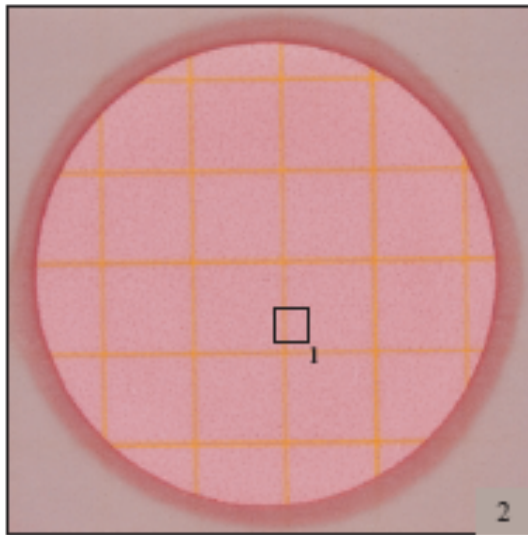
AOAC INTERNATIONAL and U.S. FDA Bacteriological Analytical Manual (BAM) define coliforms as gram-negative rods which produce acid and gas from lactose during metabolic fermentation. Coliform colonies growing on the Petrifilm EC plate produce acid which causes the pH indicator to make the gel color darker red. Gas trapped around red coliform colonies indicates confirmed coliforms.



The identification of *E. coli* may vary by country (see Reminders for Use section for incubation times and temperatures):

AOAC INTERNATIONAL validated method
E. coli = 49 (blue colonies with gas)
Total coliform = 87 (red and blue colonies with gas)

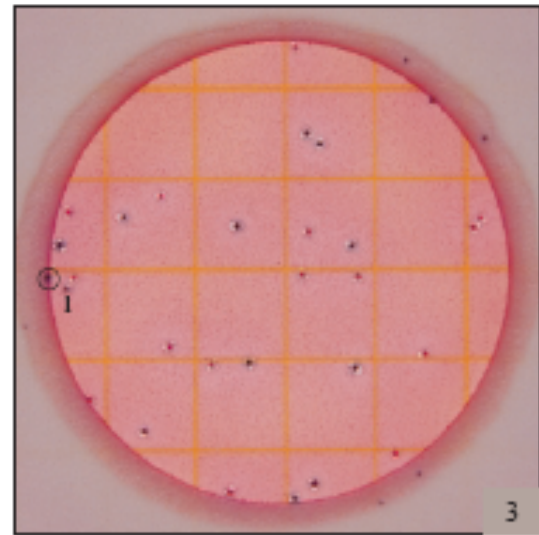
3M™ Petrifilm™ *E. coli*/Coliform Count Plate



No growth = 0

Notice the changes in gel color in figures 2 through 8. 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.

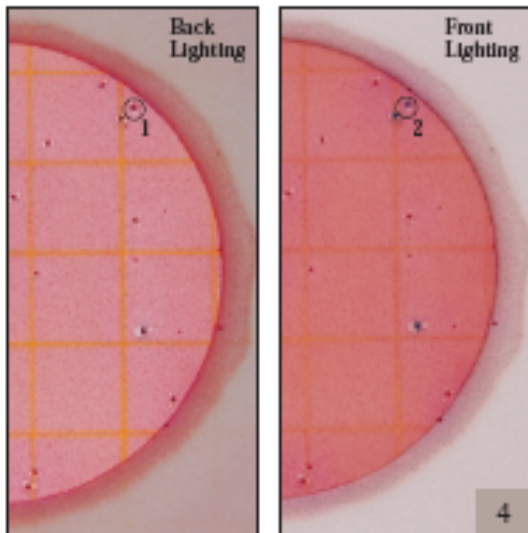


E. coli count = 13

Total coliform count = 28

The counting range for the total population on Petrifilm EC plates is 15–150.

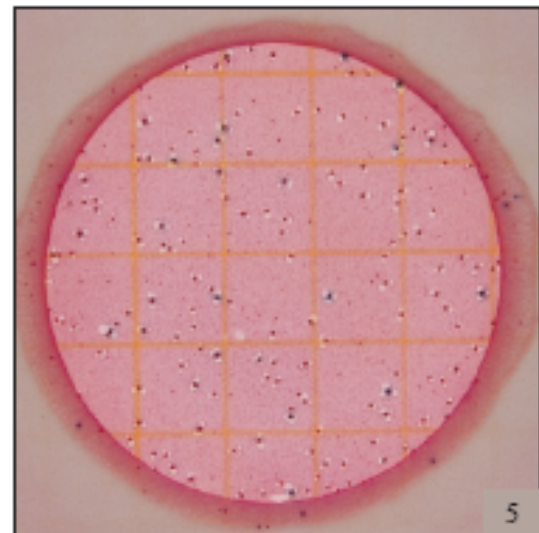
Do not count colonies that appear on the foam barrier because they are removed from the selective influence of the medium. See circle 1.



E. coli count = 3

Any blue in a colony (blue to red-blue) indicates the presence of *E. coli*. Front lighting will 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.

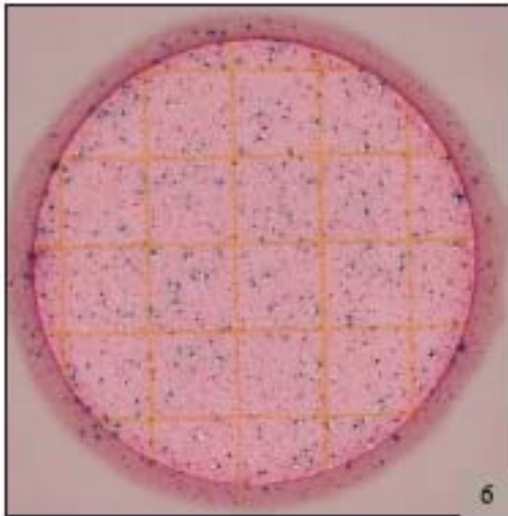


E. coli count = 17

Estimated total coliform count = 150

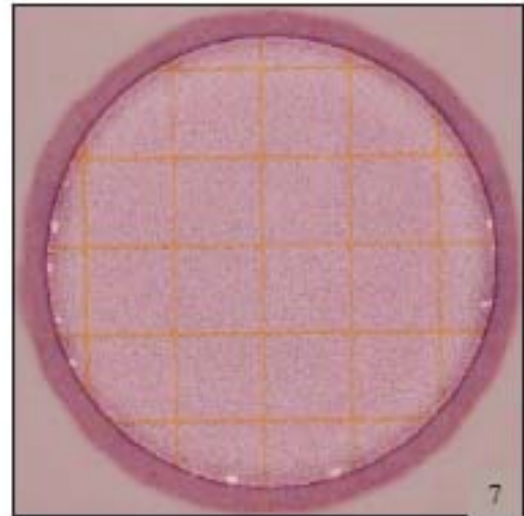
The circular growth area is approximately 20 cm². Estimates can be made on plates containing greater than 150 colonies by counting the number of colonies in one or more representative squares and determining the average number per square. Multiply the average number by 20 to determine the estimated count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

TNTC (Too Numerous to Count) *To obtain a more accurate count, dilute the sample farther.*



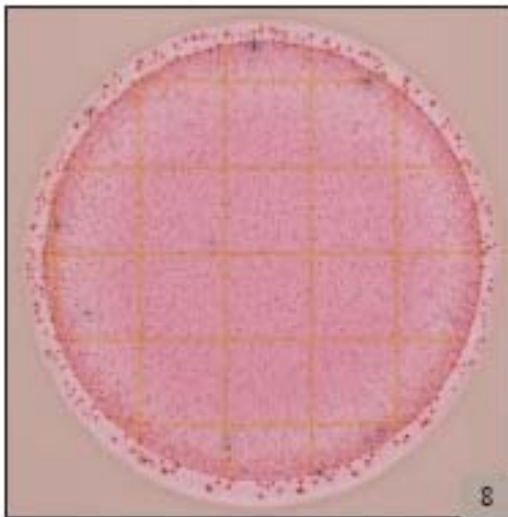
Actual count ~ 10^6

Petrifilm EC plates with colonies that are 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.



Actual count ~ 10^6

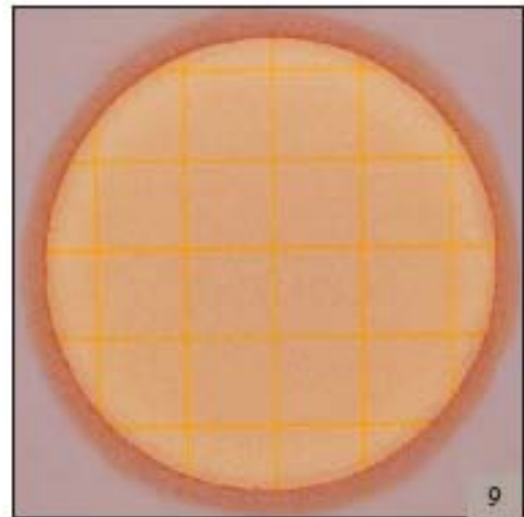
High concentrations of *E. coli* may cause the growth area to turn purple-blue.



Presumptive *E. coli* count ~ 8

Estimated total coliform count ~ 10^6

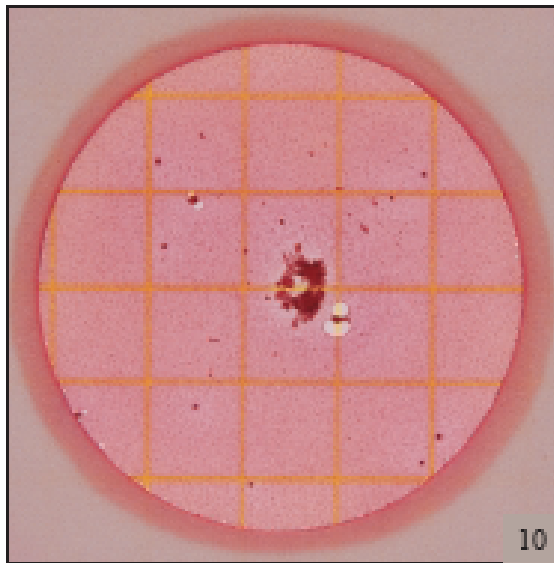
When high levels of coliforms are present ($>10^6$), some strains of *E. coli* may produce less gas and blue colonies may be less definitive. Count all blue colonies without gas and/or blue zones as presumptive *E. coli*. Pick blue colonies without gas and confirm if necessary.



Actual count ~ 10^6

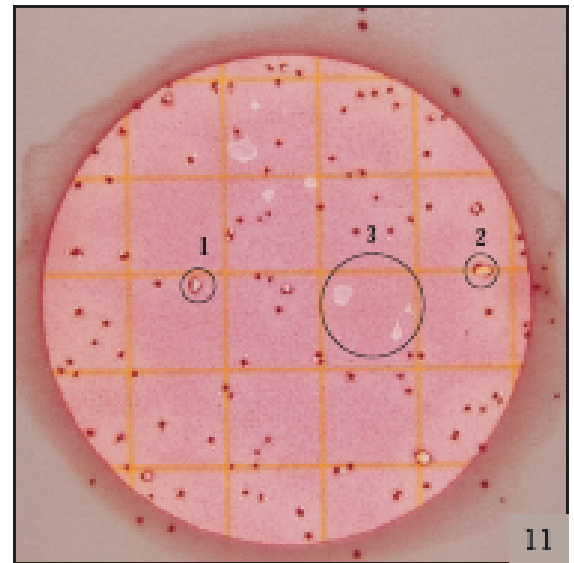
When high numbers of non-coliform organisms such as *Pseudomonas* are present on Petrifilm EC plates, the gel may turn yellow.

Bubbles



Total coliform count = 3

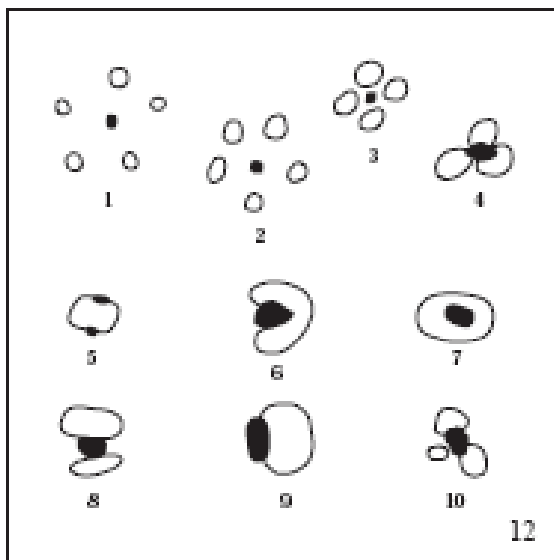
Food particles are irregularly shaped and are not associated with gas bubbles.



Total coliform count = 78

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.



Examples 1-10 show various bubble patterns associated with gas producing colonies. All should be enumerated.