

Title: Liquefier/Spreader Rules Used by the 3M™ Petrifilm™ Plate Reader

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Technology Platform: Instrumentation

Originating Location: St. Paul, Minnesota

There are several practical methods for estimating colony counts on 3M™ Petrifilm™ Aerobic Count (AC) Plates that contain liquefiers, which are analogous to spreaders on agar media.

The Petrifilm™ AC Plate Interpretation Guide (image/picture 10) directs a person who is manually counting colonies on a Petrifilm™ AC Plate on which bacteria has liquefied the gel to:

“. . . determine an average count in a few unaffected squares and then multiply by 20 to obtain the estimated count. Do not count red spots within the liquefied area.”

Another method appears in the 16th edition of Standard Methods for the Examination of Dairy Products (SMEDP) book by American Public Health Association.

“If plates prepared from the sample have spreader growth such that: 1) the area covered by the spreader or the area covered by the spreader plus the repressed area exceeds 50% of the plate area, or 2) the area of repressed growth caused by the spreader exceeds 25% of the plate area, report the plate as ‘spreader’ (SPR).”

The 3M Petrifilm Plate Reader (PPR) imaging system and algorithm method is used to calculate the total area of the Petrifilm AC plate that’s covered by liquefier colonies. The PPR counts colonies on Petrifilm AC Plates that contain liquefiers in one of two ways depending on the total area of liquefiers (the total area in square centimeters of the Petrifilm AC plate that’s covered by liquefiers). The total inoculated area of the Petrifilm AC plate is 20 cm². The algorithm uses the following decision-making process:

1. If the total area covered by liquefiers is >10 cm², then change the colony count result to 999 and add “Technician needs to view the plate and possibly edit the results. Spreader/Liquefier greater than 50% of the plate. Liquefier/Spreader area (mm²) = x” to the explanation field.
2. If the total area covered by liquefiers is ≤ 10 cm², then the algorithm does not change the colony count result, but adds “Liquefier/Spreader area (mm²) = x” to the explanation field.

The PPR reports the plate as liquefier/spreader (SPR) as required by the SMEDP method by reporting the colony count as “999” and adding an explanation that liquefiers/spreaders were present.

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The PPR manual states:

“... raw count of 999 indicates that the technician needs to view the plate and possibly edit the results. A “999” result may occur in the following situations: the counting algorithm is unable to determine whether the count is 0 or TNTC (too numerous to count) due to the background color of the plate; or liquefiers impact >50% of the plate area.”

The following images are examples of the PPR spreader/liquefier counting rules applied to Petrifilm AC Plates.

3M Petrifilm Plate Reader

File View Run Options Window Help

Plate

Sample ID:

Plate Type: AC

Dilution: 1:1 undiluted

Image Acquisition Demo (use in no barcode mode only)

Results

Red Colonies	Raw	Edited	Calculated
	999	-	-

Edit Results

Explanation: Technician needs to view the plate and possibly edit the results. Liquefier/Spreader greater than 50% of the plate. Liquefier/Spreader Area (mm²) = 1626

Excel Data Copy

All Data Fields

Mapped Data Fields

PF-RMBS

Auto Save

Copy Data to Excel

Log Data

View Log File...

Log File is Active

647 Results Saved

Mark Colony:

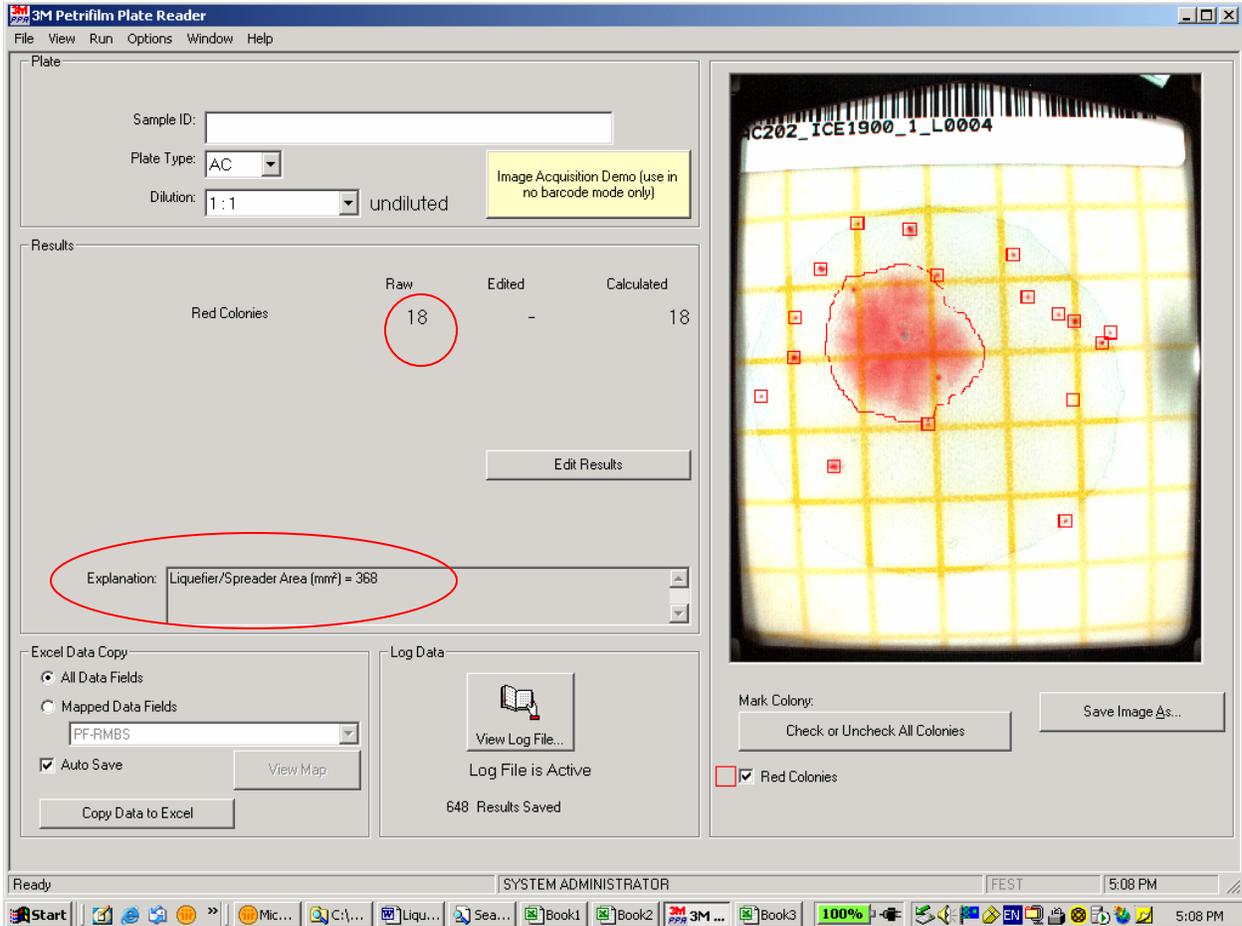
Check or Uncheck All Colonies

Save Image As...

Red Colonies

The area of this Petrifilm AC Plate that's covered by spreaders/liquefiers is 16.26 cm². Since the inoculated area of a Petrifilm AC Plate is 20 cm², the area of this Petrifilm AC Plate that's covered by spreaders/liquefiers is >50%. For this reason, the colony count result was changed to 999.

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The area of this Petrifilm AC Plate that's covered by spreaders/liquefiers is 3.68 cm². Since the inoculated area of a Petrifilm AC Plate is 20 cm², the area of this Petrifilm AC Plate that's covered by spreaders/liquefiers is <50%. For this reason, the colony count result was not changed and is reported as 18, which includes the spreader/liquefier area as 1 colony.

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