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Bacterial Enumeration



**Do you need to count
bacteria?**

**Spiral plating eliminates the
need for serial dilutions,
offers a reduction in cost per
test and standardises
counting methods**

Are you working with microorganisms and have to perform serial dilutions to produce a countable plate?

Do you test samples which require you to report, for example, a Total Viable Count or a Total Coliform Count?

Do you work with pure or mixed cultures and need to determine accurate inoculum levels for challenge testing or minimum inhibitory concentration levels?

At the moment you are probably achieving your microbial count using either of the following methods:

Spread plate

Up to 1ml of sample is put onto the surface of an agar plate and spread using a sterile spreading device. The plate is then incubated and counted, usually the following day. This technique is really only appropriate for samples that have low contamination as, if the concentration of the organisms is too high, the bacteria can clump and cause areas to be uncountable.

Pour plate

Up to 1ml of sample is placed into a Petri dish and tempered agar is added. The agar and sample are mixed by swirling the contents of the Petri dish. Sometimes an agar overlay is added prior to the plate being incubated. As with spread plates, levels of contamination of the sample are crucial.

Theoretically it is possible to count up to 1,000 colonies on either a spread or pour plate. Neither method is reliable at producing a plate where the colonies are evenly spread. With the pour plate, colonies often form at different levels throughout the agar; therefore, some of the colonies are hidden. If the plate is quite confluent, then the technician will often divide the plate into eight segments and count only one – multiplying the result to calculate the count. This not only increases the inaccuracies but, counting up to 1,000 colonies on a plate, is also very time consuming.

If you are using either of these methods, you need to know that spiral plating eliminates the need for serial dilutions – resulting in greater accuracy of results with reduced costs for both time and materials.

The basis of the technique involves the plater depositing sample onto an agar plate via a stylus in an Archimedes spiral. More sample is put onto the centre of the plate, becoming less and less as the stylus moves towards the edge of the plate. This achieves a three-fold logarithmic dilution across the plate, equivalent to three consecutive one-in-ten dilutions.

Using the spiral plater is very simple as it incorporates automatic washing and sample uptake procedures. The volume of sample can be chosen dependent on the expected concentration of organisms – the lower the level, the higher the sample volume – in the range 50µl to 400µl.

Non-diluting functions for a simple spread plate can be made for samples with low contamination levels.

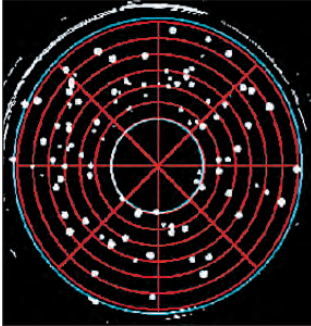
Spiral plates are counted using the grids provided. As very specific areas only are counted, the counting is both faster and more accurate over both pour and spread plates.

Many laboratories are looking to count the plates automatically to increase productivity in the laboratory and the accuracy of the count as well as decreasing costs. Automatic counting has many advantages:

1. Standardisation of the counting methods

Parameters can be stored so that the same kind of plate is always counted in the same way. Calculations are performed where necessary and all results automatically stored, thereby eliminating transcriptional errors. Even images of the plate can be stored for data retrieval and training purposes. There are no operator-to-operator differences in counting and no operator fatigue.





2. Speed

A plate can be counted in milliseconds thus increasing productivity.

3. Validation

Packages are available to show validation of the automatic counters to comply with accreditation standards. IQ OQ PQ documentation is also available.

It is important to note that any automatic counting method is dependent on the user being able to identify a good quality plate. No automatic counter can recognise a bad plate unless it is told that it is a bad plate.

With the purchase of any laboratory instrumentation, it is important that you consider the price and availability of both training and service cover.

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