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Technical Bulletin

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3M™ Petrifilm™ Plate pH Adjustment

Why must the pH of diluted samples be adjusted when plating on 3M Petrifilm Plates?

Just as time and temperature play an important role for the recovery and growth of microorganisms, pH has a major impact as well. Most microorganisms have an optimal pH growth range, and when conditions are too acidic or too basic, it may cause inhibition.

ISO 6887-1 recognizes the importance of a neutral pH when using agar, and requires acidic products in suspension to be adjusted to pH 6.5 - 7.5 prior to plating. Because 3M Petrifilm Plates are thin film media, the microenvironment in the plates requires a narrower pH range than most traditional agar methods. Additionally, indicator dyes present in the 3M Petrifilm Plates may be activated by pH outside the recommended range and in turn, may discolor the entire growth media. This is also true of other types of chromogenic media. Therefore, pH adjustment is crucial for successful results using 3M Petrifilm Plates.

To adjust the pH of a sample:

1. Prepare diluted (or undiluted) sample. Most dilution media such as 3M™ Buffered Peptone Water or 3M™ Butterfield's phosphate-buffered dilution water, has a level of buffering capacity and is designed to help buffer the pH. A pH adjustment may not be required after dilution. However, this should be determined during validation.
2. Test the pH of the dilution sample using pH strips.
3. If the pH of the diluted sample is out of the recommended range of the 3M Petrifilm Plate, add increments of either 1 N sodium hydroxide (NaOH) (for acidic samples) or 1 N hydrochloric acid (HCl) (for basic samples) until the pH is within the recommended range. Thoroughly mix samples in between each addition of acid or base.
4. Record the amount of 1 N NaOH or 1 N HCl added as the amount of base or acid will be consistent each time if the product formulation is not changed.

For more information on pH adjusting refer to the 3M Petrifilm Package Insert or 3M Petrifilm Plate Interpretation Guide.

Frequently Asked Questions

- Should the volume of 1 N NaOH or 1 N HCl be factored into the dilution?

  No, the volume of NaOH or HCl added to a sample is typically so small that it will have very little impact on the sample dilution.

- Why is a 1 N solution recommended when adjusting the pH of a sample?

  1 N solutions are widely recommend for adjusting the pH of samples. The use of 1 N solutions allows for accuracy in pH adjustment and minimal interference with sample volume. Using higher concentrations of NaOH or HCl may result in pH changes that are too large, requiring additional adjustment to fall within the required pH range.

- If the sample is plated direct without dilution, can the 1 N NaOH or 1 N HCl be added directly to the sample?

  Yes, if the sample is outside of the recommended pH range, and there is no dilution of the sample.

- Does the NaOH and HCl need to be sterile?

  No, typically 1 N NaOH and 1 N HCl are so basic or acidic that very few organisms will grow or survive. For best results, the 1 N NaOH and 1 N HCl solutions should be filter sterilized before use.

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