

## Abstract

Rainin Pipette Service conducted a study to determine the effectiveness of evaluating a pipette's "as found" status with 4 weighing samples versus 5. This study was based on extensive statistical data taken from Rainin's Calibration Database.

## Extracting Base Population from Database

For the purpose of determining the impact of evaluating a pipette using 5 weighings versus 4, Rainin used "as returned" data for pipettes calibrated with its Plan B – Extended Measurement Option. This option utilizes a series of 10 weighings to evaluate the accuracy and precision of a pipette.

The pipettes involved in the evaluation represented all types and volume sizes as found in our database, including those not manufactured by Rainin/Gilson.

The last 5 weighing values of each 10 weighing series were discarded, leaving only the first 5 samples. These weighing series of 5 samples served as our base population for this test – a total of 235,249 individual weighing series.

## Evaluation Procedure

From each 5 weighing series in the base population, the fifth weighing was then discarded. Each modified weighing series now consisted solely of the first 4 consecutive weighing samples.

Each 4 sample weighing series was then evaluated for pass/fail status based on published accuracy and precision specification.

## Evaluation Results

A total of 232,062 (98.6%) of the 235,249 base population weighing series still achieved a "pass" grade when evaluated with only the first 4 weighing samples.

Conversely, 3,187 weighing series (1.4%) that did pass with 5 weighing samples now demonstrated a "fail" when the evaluation was based only on the first 4 samples.

## "As Found" Failure Confirmation Factor

In Rainin Pipette Service, each time that a pipette fails "as found" testing, it must go through a secondary Failure Confirmation process. This confirmation is performed by a Senior level or higher technician. The purpose of this confirmation step is to eliminate any possible contributing error in an incorrect "as found" failure determination.

## Summary

Based on the results of this study, there is a slight risk of a pipette failing, with a 4-sample evaluation, that would pass with a 5-sample evaluation. However, if a pipette fails the "as found" evaluation for any reason, the Failure Confirmation is required. This second evaluation is performed by a technician with a high level of experience. The end result is that the increased risk of a false "as found" failure is nullified by this second evaluation.