

How to Validate Automated Cell Counters: Benefits of Using Validation Slides over NIST Standard Beads

Automated cell counters (<https://logosbio.com/compare-cell-counters/>) have gained popularity thanks to their ability to provide fast and precise cell counting results. Regardless of these benefits, it is essential to validate the accuracy to ensure reliable cell counting results. Beads are frequently used for the validating devices such as flow cytometers and automated cell counters.

However, there are various issues associated with using beads, which led to the development of Cell Counter Validation Slides (https://logosbio.com/cell-counting-consumables/?cell_counting_acc_category=validation) for validating the LUNA™ cell counter series. In this article, we will explore the cell counting standard and the advantages of utilizing Cell Counter Validation Slides for validating the LUNA™ cell counter series.

International Cell Counting Standard

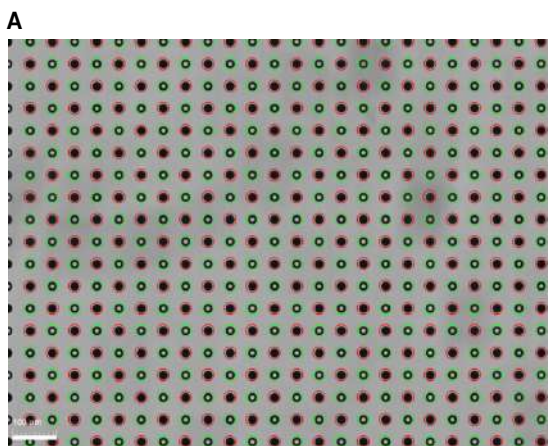
The ISO 20391 standard was developed to provide guidance on accurate cell counting and to ensure the reliability of cell counting results. The standard outlines a protocol for validating the quality of a cell counting measurement through serial dilution experiments, which can be used when reference materials are not available. However, this process can be time-consuming and complicated, requiring intricate calculations to determine the coefficient of determination and proportionality. To overcome this challenge, reference materials are recommended to ensure measurement traceability, enable comparison, and verify the measurement process. The most efficient approach is to compare the mean analytical result to a reference value obtained from certified reference materials, eliminating the need for complicated calculations. Nonetheless, choosing the appropriate reference materials can still present challenges.

Challenges with Using Validation Beads as a Reference Material

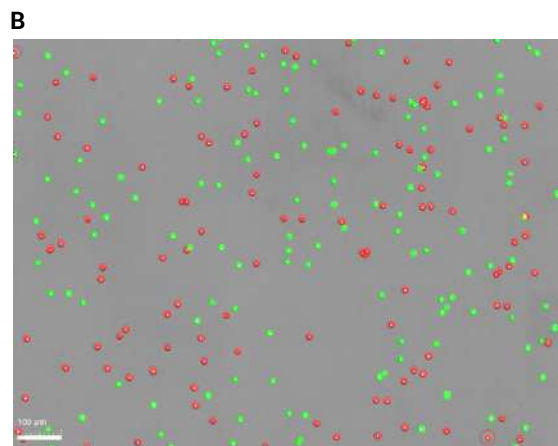
Validation beads, such as NIST (National Institute of Standards and Technology) beads, are commonly used as reference materials in various analytical methods involving particle size and counting. These beads have a known size and concentration and are frequently utilized as calibration standards for flow cytometry, microscopy, and other similar techniques. However, NIST beads are not available in fluorescent form making them unsuitable for testing viability measurements, although cell counters can provide both total cell count and viability measurements. While commercial fluorescent beads can serve as an alternative, errors during pipetting and evaporation during long-term storage may compromise their accuracy, requiring careful handling and repeated testing. Consequently, there is currently no commercially available reference material for viability assessment. Users who opt to produce their reference materials in-house would have to rely on manual counting, which is relatively imprecise and requires a large number of samples. Alternatively, flow cytometry could be used, although obtaining absolute count results can be challenging and this method is not user-friendly. Therefore, there is a need to find an alternative method for viability assessment.

Using Validation Slides as a Reference Material

Using reference materials with stability and consistency is essential to ensure accurate results in cell counting. One such option that provides this level of quality control is the use of validation slides. These slides contain pre-spotted patterns (https://logosbio.com/cell_counting_acc/cell-counter-validation-slide-bf-ii/) or pre-fixed fluorescent beads (https://logosbio.com/cell_counting_acc/cell-counter-validation-slide-fl/) with a known number of objects, eliminating issues such as concentration manipulation caused by sample loading, evaporation during storage, or uneven distribution. Furthermore, validation slides allow for the verification of total cell count and viability using both brightfield and fluorescence optics of a cell counter. Cross-validation with other equipment is also straightforward, and their stability ensures that measurement values remain consistent even with long-term storage or repeated use. By incorporating validation slides, researchers can save time and resources that would otherwise be spent conducting additional experiments to ensure accuracy.



Cell counter validation slide – BF II



Cell counter validation slide – FL

How to Assess the Accuracy Using the Cell Counter Validation Slides

The Cell Counter Validation slide protocol simplifies and streamlines the process of validating the accuracy of cell counters by providing a simple and efficient alternative to using beads. This method saves time and offers an easy approach to validate the accuracy of cell counting results.

To use the Cell Counter Validation slide protocol, follow these simple steps:

1. Check the cell concentration and viability values on the label of the Cell Counter Validation slide.
2. Insert the slide into the cell counting device.
3. Start counting using the 'IQOQ' protocol.
4. Record the total cell concentration and viability values.

