

Using BioTek's Unique Bio-Cell™

Introduction

The patented** Bio-Cell™ is a unique quartz vessel that allows for the absorbance determination of substances with a fixed vertical pathlength of 1 cm in a microplate reader. The Bio-Cell can be used to measure the 1 cm absorbance in any BioTek Microplate Reader. It is also very useful for the determination of the "k" value* required to more accurately correct the absorbance of aqueous solutions in microplates to 1 cm values with BioTek's Microplate Spectrophotometers.

Bio-Cell™ has a filling port that is located adjacent to the transmission region of the cell to allow for complete filling without interfering with the light path. Note that the inside vertical dimension is 10.00 mm, or 1.0 cm. (**Figure 1**)

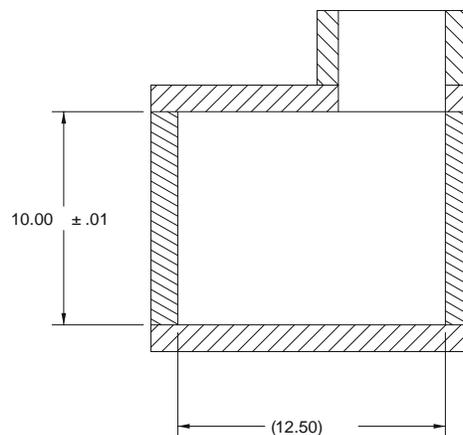


Figure 1. Cross-sectional Diagram of the Bio-Cell™

Filling the Bio-Cell™

To obtain accurate readings with the Bio-Cell, it is important that there are no air bubbles trapped in the transmission region. To avoid air bubbles, it is recommended that the Bio-Cell be tilted so that the port is located at the top with the transmission region of the Bio-Cell tilted downward (**Figure 2**). Carefully fill the Bio-Cell using a pipettor that uses 200 µl tips or a narrow Pasteur pipette so that the box portion of the cell fills completely. Note that the neck portion does not

need to be filled to the top. Place the Bio-Cell in the adapter so that the transmission region of the cell is located over the hole in the bottom of the adapter. The fill spout should be located over the solid support portion of the indent.

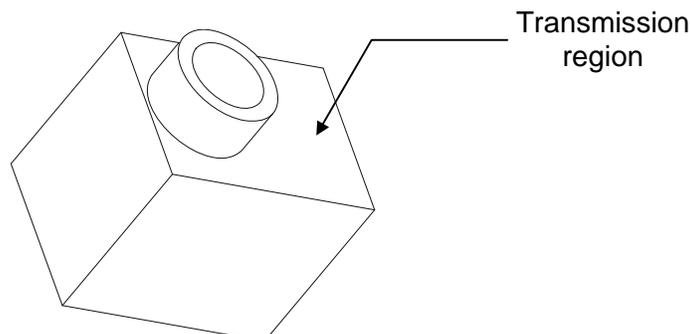


Figure 2. Bio-Cell™ with approximate orientation for filling. Note that the port opening is tilted upward so that the Bio-Cell can be completely filled.

Using the Bio-Cell™

To obtain accurate absorbance measurements, the Bio-Cell needs to be placed in one of the wells of the Bio-Cell adapter plate (**Figure 3**). Be sure to orient the Bio-Cell so that the transmission region is located over the hole through the bottom of the adapter. The wells of the adapter are situated so that the transmission region of the Bio-Cell will be located at specific 96-well plate locations. The adapter is capable of holding as many as eight Bio-Cells simultaneously.

The “k” value can be calculated by reading the filled Bio-Cell at 977 nm and at 900 nm and then subtracting the 900 nm reference absorbance from the 977 nm absorbance. If the determined “k” deviates from the default value of 0.180 (given in the KC4™ and KCjunior™ Data Analysis Software), then enter the new value at “read” time.

Alternative Uses for the Bio-Cell™

The Bio-Cell can also be utilized for purposes other than pathlength correction. Because the cell allows for vertical photometry with a fixed pathlength of 1 cm, the cell can be used for spectral scans or absorbance determinations of samples. These results can then be directly compared to values obtained using a conventional spectrophotometer and cuvettes because the light pathlengths are equivalent.

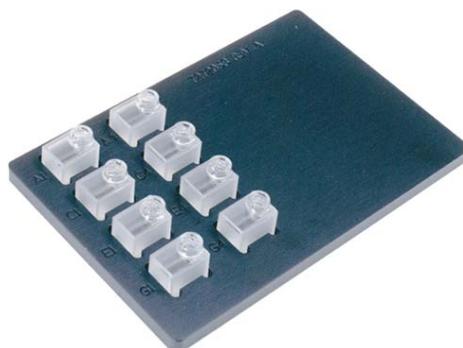


Figure 3. Bio-Cell™ Adapter with eight Bio-Cells. The Bio-Cell(s) are placed in wells corresponding to specific locations on a 96-well microplate and the adapter is placed in a microplate reader carrier. The reader can perform all of the functions with the Bio-Cell that it is capable of with microplate samples.

Emptying and Cleaning the Bio-Cell™

To empty the Bio-Cell, withdraw the fluid using a single-channel pipettor (200 µl tip) or a narrow Pasteur pipette.

The Bio-Cell is made of optical quartz and is resistant to most chemical elements, *with the exception of those containing hydrofluoric acid*. It is recommended that the Bio-Cell be cleaned by flushing with deionized or distilled water several times. To expedite drying, rinse the Bio-Cell with 95% ethanol or methanol after the last water rinse.

* The “k” value is the measured absorbance of the experimental solvent in a 1 cm pathlength used in pathlength correction.

** Bio-Cell is patented under US Patent 5,963,318.

Rev. 06/08/05