



Microplate Reader Absorbance Test Plates

Absorbance Test Plate Certification Program

Introduction

Several methods may be used to check the performance of a microplate reader. These include controls used by the laboratory and other wet tests using solutions of known optical densities. BioTek's Absorbance Test Plate checks the alignment of BioTek Microplate Absorbance Readers as well as their optical performance.

The ability of the reader to reliably measure optical density (OD) is the key criteria. A critical factor in reader performance is the alignment of its mechanical and optical systems. Routine use of the Absorbance Test Plate alignment check feature alerts the user to any alignment issues before it begins to affect the optical performance of the reader. This allows the user to take corrective action before performance is affected.

The BioTek Absorbance Test Plate is a 3 x 5 x ½ inch aluminum block manufactured to specific tolerances. Holes are machined in the Test Plate to hold neutral density glass disks. The composition of the neutral density glass disks is varied to cover an absorbance range that checks the performance of the BioTek absorbance readers through most of their operating range. Additional holes are machined into the Test Plate to check reader alignment. The dimensions of a Test Plate must meet specific criteria to allow it to detect alignment issues for all intended BioTek readers.

Alignment, Accuracy, Reproducibility, and Linearity

Alignment: Set locations on the Test Plate contain holes machined to tight tolerances. These locations are used to indicate the condition of the reader's alignment. When the Test Plate is blanked on air, the alignment holes should give absorbance of -0.015 → +0.015 for a properly aligned reader.

Accuracy: Test Plate data obtained from the microplate reader can be compared to the printed data sheet provided with the plate to show the accuracy of the reader at specified wavelengths.

Wavelength Accuracy: Test Plate 7260522 has a didymium glass filter that is used to confirm the wavelength accuracy of BioTek microplate spectrophotometers.

Repeatability: To show the precision and repeatability of the reader, the Test Plate data is read repeatedly.

Linearity: Linearity is logically established by checking the accuracy of the reader. The neutral density disks are selected to cover most of the reader's absorbance range. By

checking the accuracy of the reader at various points through its range, you establish its linearity.

Absorbance Test Plate Certification

Each Test Plate is serialized and supplied with a data sheet showing the measured absorbance for each neutral density glass disk at specified wavelengths. These measurements are traceable to N.I.S.T. through a set of N.I.S.T. certified filters. These values are stored in our Test Plate database for future reference.

The Test Plate is manufactured to exacting specifications. The materials used are selected to hold up to routine laboratory use. The neutral density glass disks are recessed within the Test Plate to minimize physical damage. All of this is done to help maintain the consistency of the performance of the Test Plate.

The laboratory can trend the performance of its microplate readers and Test Plate through periodic testing and trending the results.

BioTek offers a Test Plate Certification program to assist the laboratories maintain the quality of their results. This program includes the following elements.

- **Dimensional Checks:** The length and width of the Test Plate is checked from key datum points. Also, the position of the alignment holes is checked using a specially designed jig. These measurements determine the ability of the Test Plate to identify an alignment issue. Remember, Test Plates are designed for use with several BioTek reader models. As a result, it is essential to maintain specific tolerances to ensure proper testing of each specified reader model.
- **Optical Checks:** The Test Plate is checked with our most accurate reader. This reader is checked using a set of N.I.S.T. filters and then the Test Plate is read. The data is compared to original certified data.

Certification is dependent on the Test Plate meeting dimensional and optical requirements. A complete report on the performance of the Test Plate is provided.

Out-of-tolerance conditions are reported to the customer. The customer is given the option to correct deficiencies.

Failure to meet dimensional specifications

- If the Test Plate does not meet dimensional specifications, the plate should be replaced. This will ensure that the Test Plate can be used to check the range of BioTek readers for which it was designed. The filters can be moved from the old to the new plate as long as they meet specifications.
- If the Test Plate does not meet dimensional specifications and is not replaced, it may not detect alignment problem issues with each model of the BioTek readers.

Failure to meet optical specifications

- Data is compared to the original data for each neutral density disk. The variation is calculated and compared to a control limit.

Summary

The BioTek Absorbance Test Plate is a convenient tool for checking the alignment and performance of your BioTek Microplate Absorbance Reader.

BioTek provides a certification service that can be used to verify and maintain the quality of the Test Plate. Contact TAC@biotek.com for more information.

Test Plate Part Number	Intended Readers
3011502, 3010523 (Discontinued Products)	EL301
3110517 (Discontinued Product.)	EL310, EL309, EL308, EL307C, EL311, EL312, EL340, Ceres900HDI (3110517 Rev. C or higher)
7260522 (Current Product, Supported)	ELx800, ELx808, EL312, EL340, EL311, EL310, EL309, EL308, EL307C, Ceres900C, Ceres900HD, μ Quant, PowerWave, Synergy HT (absorbance mode) <i>Recommended test plate for service centers for testing all readers except the EL301.</i>
7262506 (Current Product, Supported)	Jig: Scanning Plate for the MQX200s and the PowerWaves
7330529 (Current Product, Supported)	This is a version of the 9000547. This version does not have the calibration sticker.
7332513 (Current Product, Supported)	Jig: This a 9000547-style plate made of aluminum. This plate is for service and production use. It has smaller alignment holes to ensure a tighter alignment criteria. <i>(BioTek Service Centers Only)</i>
7262506 (Current Product, Supported)	Scanning Plate for spectrophotometer readers <i>(BioTek Service Centers Only)</i>
8050575 (Discontinued Product)	ABx2000
9000543 (Discontinued Product)	Ceres900HDI (round holes), EL312, EL311, EL310, EL309, EL308, EL307C <i>This is a 3110517-test plate with the round holes to test the Ceres900HDI.</i>
9000545 (Discontinued Product)	EL312, EL340, EL311, EL310, EL309, EL308, EL307C, Ceres900HDI <i>This is a 9000543-test plate with five filters instead of four.</i>
9000547 (Current Product, Supported)	ELx800, ELx808, EL312, EL340, EL311, EL310, EL309, EL308, EL307C, Ceres900C, Ceres900HD, OMNI, PowerWave, μ Quant, Synergy HT (absorbance mode)