

**MVS® Calibrator Plate  
 Calibration Certificate**

Calibration Number: 19-01993	Customer: Artel, Inc.	Issue Date: 18 Dec 2019
Test Type: As Found/As Left	Address: 25 Bradley Dr. Westbrook, ME 04092	Test Date: 28 Aug 2019
Serial Number: 1233	USA	Expiration Date: 28 Aug 2020

\*Calibrator Plate was decontaminated and calibrated.

**Description of Item Calibrated:**

The MVS Calibrator Plate is used to ensure the performance of each MVS system. The Calibrator Plate is an absorbance standard that contains sealed cuvettes and a neutral density glass filter. The absorbance of each of these components is measured at 520.2 nm and 730.5 nm. The cuvette absorbance readings are corrected to a reference temperature of 25°C. The Neutral Density filter corrected values are temperature corrected absorbance values normalized to the Neutral Density Glass absorbance.

**Traceability:**

Calibration is performed on a Cary UV/VIS Spectrophotometer, Serial Number EL05073629 or MY16020009. These instruments are calibrated monthly using standards traceable to the International System of Units (SI) through the National Physical Laboratory, UKAS No. 0478, Certified Reference Materials RM-NIN35N Serial Number 7308 calibration due on 07 Sep 2021, RM-IN2N3N Serial Number 7232 calibration due on 07 Sep 2021, and RM-DID39N Serial Number 8984 calibration due on 07 Sep 2021.

**Calibration Method Document Number: 310A4874**

This calibration method has been accredited to ISO/IEC 17025, A2LA Certificate #2093-03.

The measured values reported below are embedded in the barcode on the Calibrator Plate.

Sample	Absorbance (A) @ 520.2 nm median reading, n=3 Temp corrected 25°C	Uncertainty K=2	Absorbance (A) @ 730.5 nm median reading, n=3 Temp corrected 25°C	Uncertainty K=2
	Neutral Density Filter	1.1043	0.0026	0.8257
Cuvette 1	0.0389	0.0013	0.0416	0.0013
Cuvette 2	1.9863	0.0054	0.3702	0.0021
Cuvette 3	0.3929	0.0020	0.3697	0.0021
Cuvette 4	1.1895	0.0035	0.3692	0.0021
Cuvette 5	2.4007	0.0060	0.3698	0.0021



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The values reported below are Neutral Density Filter corrected and are reported on the Data Manager MVS System Calibration Report.

Sample	Absorbance (A)	Uncertainty	Absorbance (A)	Uncertainty
	@ 520.2 nm median reading, n=3 ND corrected Temp corrected 25°C	K=2	@ 730.5 nm median reading, n=3 ND corrected Temp corrected 25°C	K=2
Cuvette 1	0.0352	0.0012	0.0504	0.0015
Cuvette 2	1.7987	0.0065	0.4483	0.0027
Cuvette 3	0.3558	0.0031	0.4477	0.0027
Cuvette 4	1.0772	0.0041	0.4471	0.0027
Cuvette 5	2.1740	0.0075	0.4479	0.0027

These results relate only to the MVS Calibrator Plate identified in this report.

**Uncertainty:**

Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

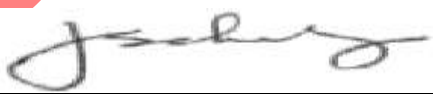
**Additional Information:**

The MVS Calibrator Plate is used to normalize the absorbance measurements made by the MVS Plate Reader to correlate with those made by a reference spectrophotometer. The Data Manager software obtains critical information from the barcode concerning the absorbance standards used in the Calibrator Plate, then compares and adjusts the readings of the Plate Reader accordingly. Upon issuing of this certificate it is indicated that all components pass manufacturer specifications.

The contents of the MVS Calibrator Plate are subject to degradation with time, extreme temperature changes, and prolonged exposure to light. The plate should be stored in darkness in its case at room temperature (15°C to 30°C) between uses to ensure the shelf life. Prior to use, the MVS Calibrator Plate should be thermally equilibrated to room temperature. Handle the MVS Calibrator Plate with extreme care, and adhere to the cleaning procedures described in the MVS Procedure Guide.

The A2LA symbol does not imply certification/approval of the products, but rather accreditation of the competency of the Artel Laboratory to perform this calibration. This calibration certificate shall not be reproduced except in full, without written approval of the Artel Laboratory.

The MVS Calibrator Plate is covered by patents listed at <http://www.artel.co/patents>

Performed by:   
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Date: 18 Dec 2019

Authorized by:   
Technical Manager: Kristi Cande

Date: 18 Dec 2019