

Volume Measurement in Greiner Bio-One 781101 384-Well Polystyrene Microplates Using the Scarlett™ 01 Volume Analysis System

Summary

The Scarlett™ 01 Volume Analysis System successfully measured liquid volumes in Greiner Bio-One 781101 384-well microplates across multiple liquid types and dispense volumes. Measurements demonstrate strong agreement with calibrated reference volumes throughout the evaluated range.

Key Results

- Scarlett successfully measured liquid volumes in **Greiner Bio-One 781101** 384-well polystyrene microplates.
- Successful volume measurement from **10–110 µL**
- Liquids evaluated:
 - **DI H₂O**
 - **DI H₂O + Tartrazine**
 - **DMSO (≥99.9%)**
 - **Cell Culture Media (DMEM/F12 (1X))**
- Observed Inaccuracy: **-2.18% to 2.63%**
- Observed Precision (CV): **0.48% - 2.54%**
- Measurements demonstrated good agreement with calibrated syringe reference volumes across the tested volume ranges.

Performance Overview

Table 1. Test Summary

Parameter	Value
Plate Manufacturer / Model	Greiner Bio-One 781101
Plate Type	384-Well, Square-well, Flat-bottom, Polystyrene
Volume Range Evaluated	10–120 µL
Liquids Evaluated	4
Maximum Inaccuracy	≤2.6%
Maximum CV	2.5%

Verification Results

Across all tested liquids, measured volumes closely matched calibrated reference volumes. Inaccuracy values ranged from -2.18% to +2.63%, while coefficient of variation (CV) values remained below 2.5%.

Table 2. Measurement Performance Results

Liquid	Target Volume	n	Mean Volume	^a Inaccuracy (%)	CV (%)
DI H ₂ O	10.12 µL	6	10.17 µL	0.45%	2.54%
	20.06 µL	6	19.62 µL	-2.18%	1.77%
	99.56 µL	6	98.09 µL	-1.48%	0.58%
DI H ₂ O + Tartrazine	10.12 µL	5	10.15 µL	0.33%	0.98%
	20.06 µL	6	20.59 µL	2.63%	0.99%
	30.18 µL	6	29.87 µL	-1.04%	0.88%
	90.32 µL	4	90.18 µL	-0.16%	0.45%
DMSO	10.12 µL	12	9.94 µL	-1.79%	2.53%
	59.94 µL	6	60.76 µL	1.37%	0.60%
	90.32 µL	6	91.56 µL	1.37%	0.48%
DMEM/F12	50.24 µL	4	49.35 µL	-1.77%	1.72%
	70.06 µL	5	68.61 µL	-2.07%	1.82%
	90.32 µL	5	90.70 µL	0.42%	1.10%

^a – Inaccuracy (%) is calculated relative to calibrated syringe reference volumes

Measurement Method

Measurements were performed using plate- and liquid-specific calibration curves. Calibration curves were generated using reference volumes dispensed by Hamilton glass syringes calibrated by RISE (Research Institutes of Sweden) according to ISO 8655 procedures. Reported inaccuracy values are relative to calibrated reference volumes.

Conclusion

The Scarlett™ 01 Volume Analysis System demonstrated accurate and precise liquid volume measurements in Greiner Bio-One 781101 microplates using DI H₂O, DI H₂O + tartrazine, DMSO, and DMEM/F12 media over a volume range of 10-110 µL. These results support reliable volume verification and quality control workflows in laboratory and automated liquid handling environments.

Your plates. Your reagents.

Your workflow.

Learn how Scarlett™ 01 can support your volume verification workflow.

