

Axygen® 70 µL Automation Tips in 384-well Format for Agilent® Bravo™/Velocity 11 – Precision and Accuracy



SnAPPShots

A brief technical report from the Corning Applications Group

Srividya Dadi, Audrey Bergeron, and Hannah Gitschier
Corning Incorporated, Life Sciences
Kennebunk, Maine

Introduction

Automated liquid-handling and high-throughput screening (HTS) are widely used for drug discovery, molecular biology applications, and genomics. For HTS, reliable sample preparation and delivery methods have become critical to assay performance. Corning has a line of 70 µL pipet tips in a 384-well format, which have been specifically designed for applications using the Agilent Bravo/Velocity 11 automated liquid handling platform.

The focus of this study was to evaluate the dispensing volume accuracy and precision of the Axygen 384-well, 70 µL tips on the Agilent Bravo/Velocity 11 automation platform, as compared to Competitor 384-well, 70 µL tips. These criteria were measured using the Artel Multichannel Verification System (MVS®), which calculates the volume of dispensed samples using an absorbance-based measurement system. The results demonstrate that Axygen 384-well, 70 µL tips are comparable to Competitor 384-well, 70 µL tips using the Agilent Bravo/Velocity 11 liquid handling workstation to dispense volumes as low as 5 µL and as high as 70 µL.

Materials and Methods

Tips Evaluated

Axygen 384-well, 70 µL tips (Corning Cat. No. VT-384-70UL-R) and Competitor 384-well, 70 µL tips.

Methods

The Agilent Bravo/Velocity 11 automation platform was used to assess accuracy, as percent deviation (% D), and precision, as coefficient of variation (% CV), for Axygen 384-well, 70 µL tips and Competitor 384-well, 70 µL tips.

To test the ability of each brand of tips to dispense accurately and precisely, 384-well, 70 µL tips were used to aspirate from an Axygen Low Profile reservoir (Corning Cat. No. RES-SW384-LP) and dispense into a Corning 384-well black with clear bottom microplate (Corning Cat. No. 3711). For the 5 µL test volume, each tip aspirated 5 µL of Range B solution (Artel Cat. No. MVS-204) and dispensed 5 µL into 50 µL of diluent solution (Artel Cat. No. MVS-202) in a single well. For the 70 µL test volume, each tip aspirated 70 µL of Range A solution (Artel Cat. No. MVS-203) and dispensed 70 µL into each well. To determine the volume of liquid dispensed into each well, absorbance readings for the solutions – diluted Range B solution for 5 µL dispense and Range A solution for 70 µL dispense – were measured using an Artel ELx800NB® Plate Reader (Artel Cat. No. 1311197). Each study was performed 3 independent

times for each brand of tips for a total of 1,152 tip dispenses. Evaluation criteria include percent deviation from the set dispense volume (% D), and the variability in dispense volume (% CV) for the 1,152 tip dispenses.

Results/Discussion

The evaluation criteria for comparing Axygen 384-well, 70 µL tips with Competitor 384-well, 70 µL tips are listed in Tables 1 and 2. The ability of the pipette tips to dispense 5 µL and 70 µL volumes accurately and precisely was determined through the analysis of the mean volume dispensed across 3 replicates of 384 tips each. The precision of each brand of tip is represented by the coefficient of variation (% CV) of the replicates. Similarly, the accuracy is represented by the percent deviation (% D) from the target volume of the replicates. It is important to note that the accuracy of liquid dispense may vary depending on the method and liquid class selection chosen when using the liquid handling platform, however for these studies the method and liquid used for testing was identical for Axygen 384-well, 70 µL tips and Competitor 384-well, 70 µL tips.

As demonstrated in Figure 1, Axygen 384-well, 70 µL tips displayed comparable precision to Competitor 384-well, 70 µL tips using the Agilent Bravo/Velocity 11 automation system. There was no significant difference in the precision of each brand of tips when dispensing 5 µL (Figure 1A) or 70 µL (Figure 1B).

Table 1. Evaluation Criteria for 5 µL Dispense Volume

	Axygen	Competitor
No. of wells	1,152	1,152
Outliers	3	7
Target Volume (µL)	5.00	5.00
% CV (n = 3 replicates)	1.86 ± 0.10%	1.72 ± 0.22%
% D (n = 3 replicates)	4.09 ± 0.45%	4.54 ± 0.26%

Table 2. Evaluation Criteria for 70 µL Dispense Volume

	Axygen	Competitor
No. of wells	1,152	1,152
Outliers	3	4
Target Volume (µL)	70.00	70.00
% CV (n = 3 replicates)	1.63 ± 0.15%	1.63 ± 0.16%
% D (n = 3 replicates)	2.35 ± 0.24%	2.07 ± 0.25%

Data in tables show ± standard deviation (SD).

As demonstrated in Figure 2, Axygen® 384-well, 70 µL tips displayed comparable accuracy to Competitor 384-well, 70 µL tips using the Agilent® Bravo™/Velocity 11 automation system. There was no significant difference in the accuracy of each brand of tips when dispensing 5 µL (Figure 2A) or 70 µL (Figure 2B).

Conclusions

- ▶ Axygen 384-well, 70 µL tips demonstrate comparable precision and accuracy to Competitor 384-well, 70 µL tips using the Agilent Bravo/Velocity 11 Liquid Handling Workstation to dispense volumes as low as 5 µL and as high as 70 µL.

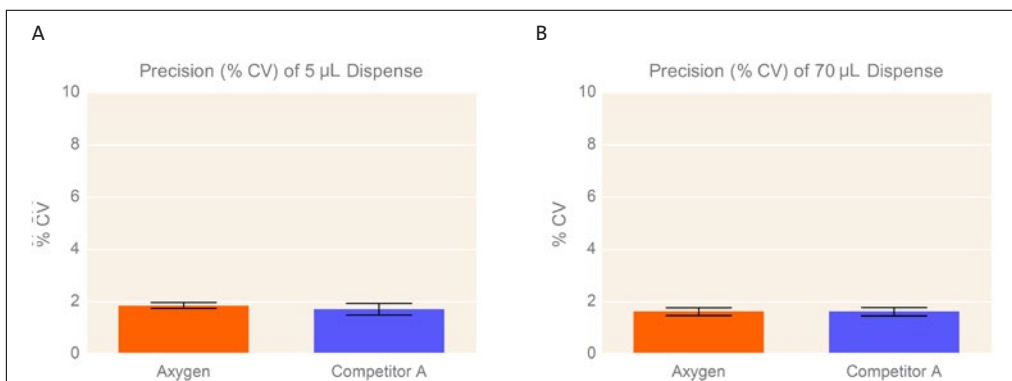


Figure 1. Precision (% CV) Analysis of 384-well, 70 µL tips. The % CV of Axygen and Competitor 70 µL tips dispensing (A) 5 µL and (B) 70 µL volume using the Agilent Bravo/Velocity 11 liquid handler was determined using the Artel MVS® system. There was no significant difference in % CV between each brand. Data shown with standard deviation (SD) for 3 independent experiments of 384 wells each.

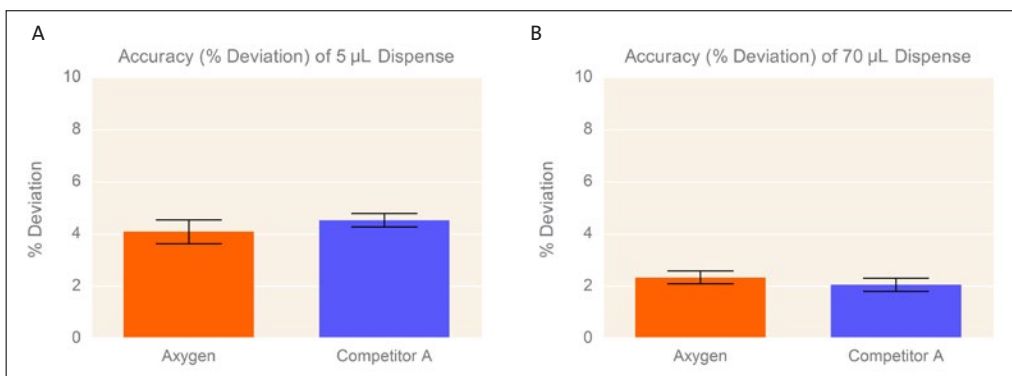


Figure 2. Accuracy (% D) Analysis of 384-well, 70 µL tips. The % D of Axygen and Competitor 70 µL tips dispensing (A) 5 µL and (B) 70 µL volume using the Agilent Bravo/Velocity 11 liquid handler was determined using the Artel MVS system. There was no significant difference in % D between each brand. Data shown with SD for 3 independent experiments of 384 wells each.

For more specific information on claims, visit the Certificates page at www.corning.com/lifesciences.

Warranty/Disclaimer: Unless otherwise specified, all products are for research use only. Not intended for use in diagnostic or therapeutic procedures. Not for use in humans. Corning Life Sciences makes no claims regarding the performance of these products for clinical or diagnostic applications.

For additional product or technical information, visit www.corning.com/lifesciences or call 800.492.1110. Customers outside the United States, call +1.978.442.2200 or contact your local Corning sales office.

Corning Incorporated Life Sciences

836 North St.
Building 300, Suite 3401
Tewksbury, MA 01876
t 800.492.1110
t 978.442.2200
f 978.442.2476

www.corning.com/lifesciences

Worldwide Support Offices

ASIA/PACIFIC
Australia/New Zealand
t 61 427286832
China
t 86 21 3338 4338
f 86 21 3338 4300
India
t 91 124 4604000
f 91 124 4604099

Japan
t 81 3-3586 1996
f 81 3-3586 1291
Korea
t 82 2-796-9500
f 82 2-796-9300
Singapore
t 65 6572-9740
f 65 6861-2913
Taiwan
t 886 2-2716-0338
f 886 2-2516-7500

EUROPE

France
t 0800 916 882
f 0800 918 636
Germany
t 0800 101 1153
f 0800 101 2427
The Netherlands
t 31 20 655 79 28
f 31 20 659 76 73
United Kingdom
t 0800 376 8660
f 0800 279 1117

All Other European Countries

t 31 (0) 20 659 60 51
f 31 (0) 20 659 76 73

LATIN AMERICA

grupoLA@corning.com
Brasil
t (55-11) 3089-7400
f (55-11) 3167-0700
Mexico
t (52-81) 8158-8400
f (52-81) 8313-8589

CORNING | **FALCON** | **AXYGEN** | **GOSELIN** | **PYREX**