Axygen® 50 µL Automation Tips for Tecan® Freedom EVO® 200 with LiHa head – Precision and Accuracy

AXYGEN
A Corning Brand

SnAPPShots
A brief technical report from the Corning Applications Group

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Introduction

Automated liquid-handling and high throughput screening (HTS) are widely used for drug discovery, molecular biology, and genomics. For HTS, reliable sample preparation and delivery methods have become critical to assay performance. Corning's Axygen® 50 µL pipet tips, which have been specifically designed for applications using the Tecan® Freedom EVO® 200 with LiHa head automation platform (Tecan Cat. No. 298).

The focus of this study was to evaluate the dispensing volume accuracy and precision of the Axygen 50 µL tips on the Tecan Freedom EVO 200 with LiHa head automation platform as compared to Competitor 50 µL tips. These criteria were measured using the Artel Multichannel Verification System (MVS®), which calculates the volume of dispensed samples with an absorbance-based measurement system. The results demonstrate that Axygen 50 µL tips are comparable to Competitor 50 µL tips using the Tecan Freedom EVO® 200 with LiHa head automation platform to dispense volumes as low as 5 µL and as high as 50 µL.

Materials/Methods

Tips evaluated: Axygen 50 µL tips (Corning Cat. No. TT-50-CBK-HTR) and Competitor 50 µL tips.

Methods

The Tecan Freedom EVO 200 with LiHa head automation platform was used to assess accuracy, as percent deviation (% D), and precision, as coefficient of variation (% CV), for Axygen 50 µL tips and Competitor 50 µL tips.

To test the ability of each brand of tips to dispense accurately and precisely, a column of 8 tips was arranged so that each tip aspirated from an Axygen low profile reservoir (Corning Cat. No. RES-SW96-LP) and dispensed into 1 column of a Corning® 96-well black clear bottom microplate (Corning Cat. No. 3631). For the 5 µL test volume, each tip aspirated 5 µL of Range C solution (Artel Cat. No. MVS-205) and dispensed 5 µL into 195 µL of diluent solution (Artel Cat. No. MVS-202) in each well. For the 50 µL test volume, each tip aspirated 50 µL of Range A solution (Artel Cat. No. MVS-203) and dispensed 50 µL into 150 µL of diluent solution in each well. To determine the volume of liquid dispensed into each well, absorbance readings for the diluted solutions: Range C solution for 5 µL dispense and Range A solution for 50 µL dispense, were measured using an Artel ELx800NB® plate reader (Artel Cat. No. 1311197). Studies were performed six independent times for each brand of tips for a total of 48 replicates. Evaluation criteria include percent deviation from the set dispense volume (% D) and variability in dispense volume (% CV) for the 48 replicates.

Results/Discussion

The evaluation criteria for comparing Axygen 50 µL tips with Competitor 50 µL tips are listed in Tables 1 and 2. The ability of the pipet tips to dispense 5 µL and 50 µL volumes accurately and precisely was determined through the analysis of the mean volume dispensed across 48 replicates. The precision of each brand of tip is represented by the % CV of the replicates. Similarly, the accuracy is represented by the % 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 chosen when using the automation platform. However, the method and liquid used for these studies were identical for Axygen 50 µL tips and Competitor 50 µL tips.

As demonstrated in Figure 1, Axygen 50 µL tips displayed comparable precision to Competitor 50 µL tips using the Tecan Freedom EVO 200 with LiHa head automation platform. There was no

Table 1. Evaluation Criteria for 5 µL Dispense Volume

5 µL	Axygen	Competitor
n	48	48
Target Volume (µL)	5.00	5.00
% CV	4.13% ± 0.22%	4.20% ± 0.50%
% D	2.19% ± 0.46%	2.88% ± 0.42%
Total No. of Outliers	0	0

Table 2. Evaluation Criteria for 50 µL Dispense Volume

50 µL	Axygen	Competitor
n	48	48
Target Volume (µL)	50.00	50.00
% CV	0.66% ± 0.11%	0.60% ± 0.10%
% D	5.83% ± 0.27%	5.93% ± 0.35%
Total No. of Outliers	0	0

Data in tables shows ± standard deviation.

significant difference in the precision of each brand of tips when dispensing 5 µL (Figure 1A) or 50 µL (Figure 1B).

As demonstrated in Figure 2, Axygen® 50 µL tips displayed higher accuracy than Competitor 50 µL tips using the Tecan Freedom EVO 200 with LiHa head automation platform to dispense 5 µL (Figure 2A). The Axygen 50 µL tips displayed comparable accuracy to 50 µL tips with no significant difference in the accuracy of each brand of tips (Figure 2B).

Conclusions

- Axygen 50 µL tips demonstrate comparable precision to Competitor 50 µL tips using the Tecan® Freedom EVO® 200 with LiHa head automation platform to dispense volumes as low as 5 µL and as high as 50 µL.
- Axygen 50 µL tips demonstrate comparable accuracy to Competitor 50 µL tips using the Tecan Freedom EVO 200 with LiHa head automation platform to dispense 50 µL and higher accuracy to dispense 5 µL.

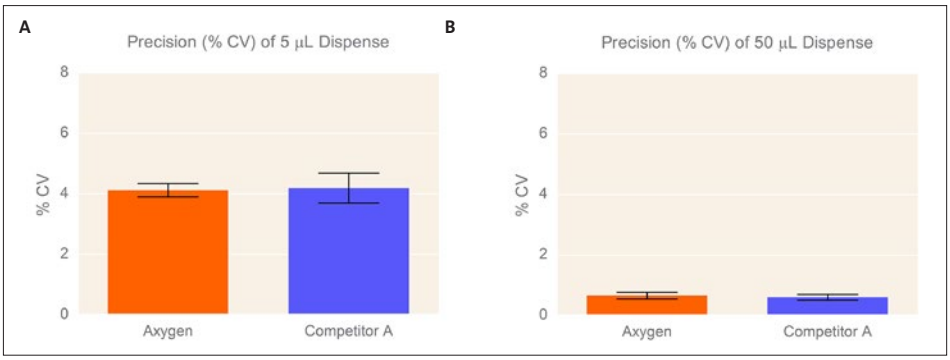

Figure 1. Precision (% CV) Analysis of 50 µL Tips. The % CV of Axygen and Competitor 50 µL tips dispensing (A) 5 µL and (B) 50 µL volumes using the Tecan Freedom EVO 200 with LiHa head automation platform was determined using the Artel MVS System. There was no significant difference in the % CV between each brand. Data shown with standard deviation (SD). n=48.

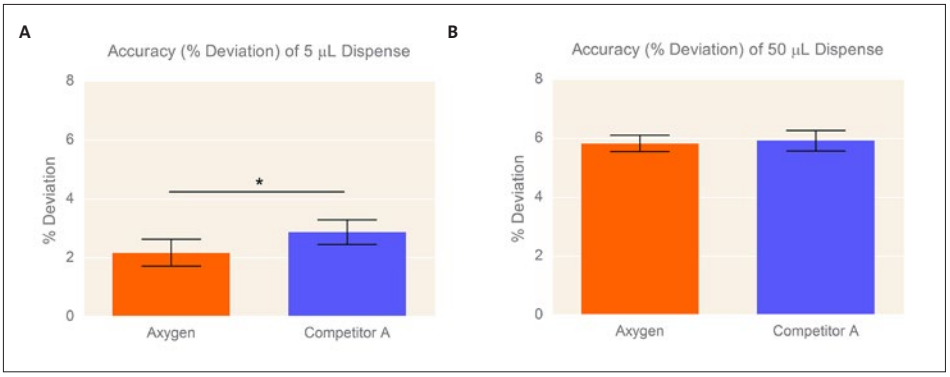

Figure 2. Accuracy (% D) Analysis of 50 µL Tips. The % D of Axygen and Competitor 50 µL tips dispensing (A) 5 µL and (B) 50 µL volumes using the Tecan Freedom EVO 200 with LiHa head automation platform was determined using the Artel MVS System. (A) Axygen tips displayed significantly lower % D, and thus higher accuracy, than Competitor tips dispensing 5 µL. *P<0.05 (B) There was no significant difference in the % D between each brand dispensing 50 µL. Data shown with SD. n=48.

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