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

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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 applications, and genomics. For HTS, reliable sample preparation and delivery methods have become critical to assay performance. Corning has a line of Axygen® 200 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 200 µL tips on the Tecan Freedom EVO 200 with LiHa head automation platform as compared to Competitor 200 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 200 µL tips are comparable to Competitor 200 µL tips using the Tecan Freedom EVO 200 with LiHa automation platform to dispense volumes as low as 20 µL and as high as 200 µL.

Materials/Methods

Tips evaluated: Axygen 200 µL tips (Corning Cat. No. TT-200-CBK-HTR) and Competitor 200 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 200 µL tips and Competitor 200 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 20 µL test volume, each tip aspirated 20 µL of Range B solution (Artel Cat. No. MVS-204) and dispensed 20 µL into 180 µL of diluent solution (Artel Cat. No. MVS-202) in each well. For the 200 µL test volume, each tip aspirated 200 µL of Range A solution (Artel Cat. No. MVS-203) and dispensed 200 µL into each well. To determine the volume of liquid dispensed into each well, absorbance readings for the diluted solutions: Range B solution for 20 µL dispense and Range A solution for 200 µL dispense, were measured using an Artel ELx800NB® Plate Reader (Artel Cat. No. 1311197). Studies were performed six (6) independent times for each brand of tips for a total of 48 replicates. Evaluation criteria include % D from the set dispense volume, and the % CV in dispense volume for the 48 replicates.

Results/Discussion

The evaluation criteria for comparing Axygen 200 µL tips with Competitor 200 µL tips are listed in Tables 1 and 2. The ability of the pipet tips to dispense 20 µL and 200 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 selection chosen when using the automation platform. However for these studies the method and liquid used for testing was identical for Axygen 200 µL tips and Competitor 200 µL tips.

As demonstrated in Figure 1, Axygen 200 µL tips displayed comparable precision to Competitor 200 µL tips using the Tecan Freedom EVO 200 with LiHa head automation platform. There was no significant difference in the precision of each brand of tips when dispensing 20 µL (Figure 1A) or 200 µL (Figure 1B).

Table 1. Evaluation Criteria for 20 µL Dispense Volume

20 µL	Axygen	Competitor
n	48	48
Target Volume (µL)	20.00	20.00
% CV	0.93% ± 0.29%	1.2% ± 0.17%
% D	3.03% ± 0.12%	2.80% ± 0.31%
Total No. of Outliers	1	0

Table 2. Evaluation Criteria for 200 µL Dispense Volume

200 µL	Axygen	Competitor
n	48	48
Target Volume (µL)	200.00	200.00
% CV	1.94% ± 0.27%	1.99% ± 0.33%
% D	2.92% ± 0.45%	2.79% ± 0.38%
Total No. of Outliers	6	6

Data in tables shows ± standard deviation.

As demonstrated in Figure 2, Axygen® 200 µL tips displayed comparable accuracy to Competitor 200 µL tips using the Tecan® Freedom EVO® 200 with LiHa head automation platform. There was no significant difference in the accuracy of each brand of tips when dispensing 20 µL (Figure 2A) or 200 µL (Figure 2B).

Conclusions

Axygen 200 µL tips demonstrate precision and accuracy comparable to Competitor 200 µL tips using the Tecan Freedom EVO 200 with LiHa head automation platform to dispense volumes as low as 20 µL and as high as 200 µL.

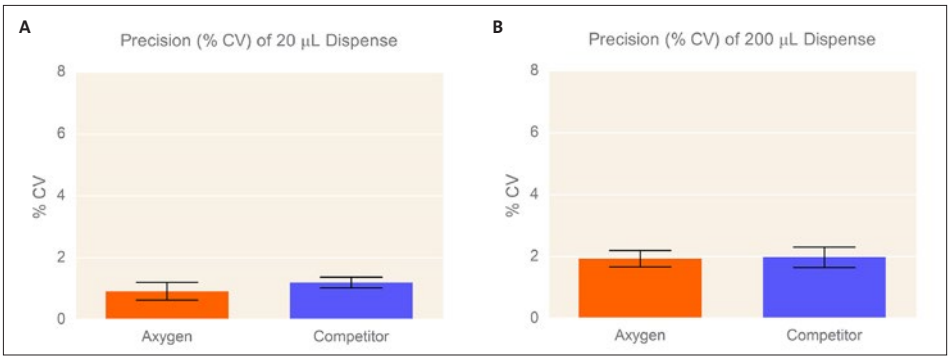

Figure 1. Precision (% CV) Analysis of 200 µL Tips. The % CV of Axygen and Competitor 200 µL tips dispensing (A) 20 µL and (B) 200 µL volume using the Tecan Freedom EVO 200 with LiHa head automation platform was determined using the Artel MVS System. There was no significant difference in the % CV between each brand. Data shown with standard deviation (SD). n=48.

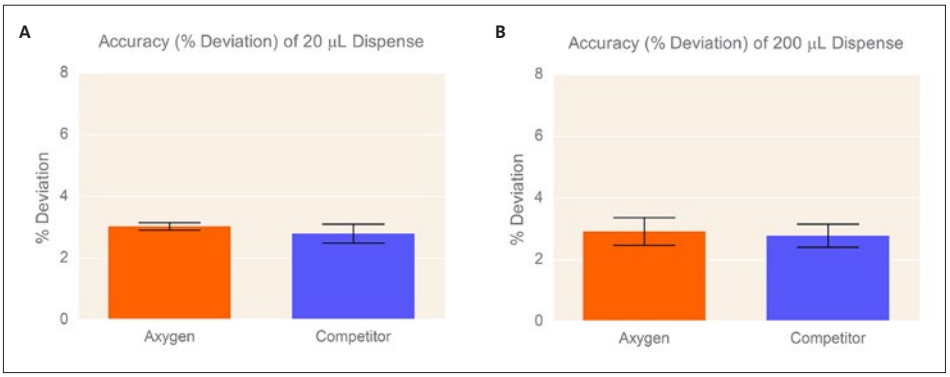

Figure 2. Accuracy (% D) Analysis of 200 µL Tips. The % D of Axygen and Competitor 200 µL tips dispensing (A) 20 µL and (B) 200 µL volume using the Tecan Freedom EVO 200 with LiHa head automation platform was determined using the Artel MVS System. There was no significant difference in the % D between each brand. Data shown with SD. n=48.

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