

# Low Retention Performance of Axygen<sup>®</sup> MaxRecovery+<sup>™</sup> Pipette Tips

CORNING

## Application Note

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### Introduction

The ability to dispense small volumes accurately is critical when preparing samples for drug discovery, molecular biology, and genomics. This requires minimizing the volume that remains within pipette tips upon dispensing. To achieve this, different coatings and resin additives have been used to create pipette tips with low retention (Figure 1). However, the chemistries used to achieve this attribute have been relatively unpublicized with little regard for compatibility with commonly used solvents, reagents, etc. used in laboratory settings. In addition, these chemistries may come off the pipette tip surface in the presence of different solvents and could contaminate assays such as silicone inhibiting PCR. The Axygen MaxRecovery+ pipette tips address these concerns as a high performing, solvent resistant low retention tip, with no intentionally added PFAS. Here we highlight the performance of Axygen MaxRecovery+ pipette tips compared to 3 comparable brands of low retention pipette tips.

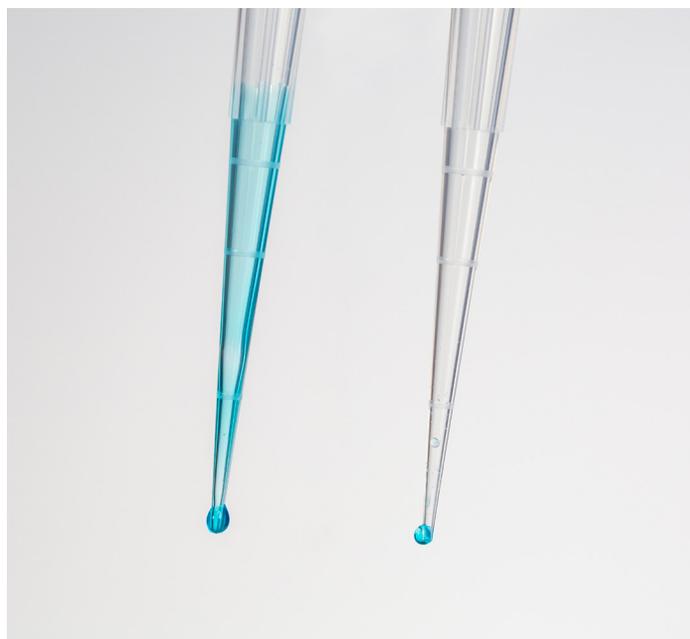
### Materials and Methods

The volume of liquid retained by various 200  $\mu$ L pipette tips was measured directly using the Artel MVS<sup>®</sup> Multichannel Verification System (Advanced Instruments) with the test liquid containing a mix of 50% glycerol (Thermo Fisher J64719.AK), 40% green food color (McCormick<sup>®</sup>), and 10% high quality cell culture grade water (Corning 25-055-CM). The tips included standard polypropylene tips as a control (Corning PP; Corning MRF-200NX-R-S), Axygen MaxRecovery+ tips (Corning MRF-200NX-L-R-S), and 3 comparable low retention tip types from different vendors. For each test, 200  $\mu$ L of the mix was drawn into a pipette tip and dispensed with 16 tips tested per type. The fluid remaining in the tip was recovered by rinsing three times with 200  $\mu$ L of the Artel MVS QualAssure<sup>®</sup> Diluent (MVS-202) into a 96-well microplate (Corning 3631). The results were quantified by the Artel MVS and subsequently converted from absorbance to volume using the standard curve for the test liquid.

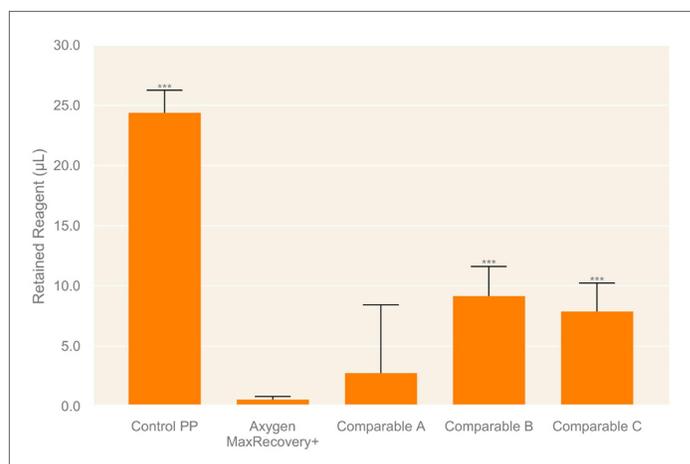
A visual comparison was also completed using the same method as above through reagent mix dispense to qualitatively measure performance.

### Results and Discussion

From the data shown in Figure 2, the Axygen MaxRecovery+ pipette tips demonstrate excellent low retention performance against comparable brand tips, effectively reducing the retained volume of test dye to less than 1  $\mu$ L. In addition to reducing the overall residual dye retained in the tip, Axygen MaxRecovery+ tips are also consistently high performing with the smallest standard deviation, a feat the comparable brand low retention tips struggled to achieve.

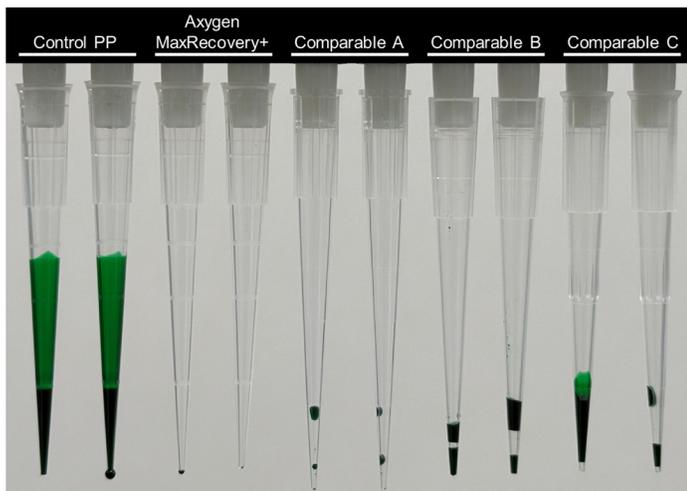


**Figure 1.** A control polypropylene pipette tip (left) and an Axygen MaxRecovery+ tip (right) after pipetting a blue liquid.



**Figure 2.** Comparison of liquid retention by various pipette tips using a mix of 50% glycerol, 40% green food coloring, and 10% water. Retained reagent is shown in  $\mu$ L. Error bars represent standard deviation. N = 16, \*\*\*if  $p < 0.001$  in comparison to Axygen MaxRecovery+ tips.

Where quantitative retention testing is not possible, a visual test method can be used to compare the efficacy of tips side by side. Axygen MaxRecovery+ tips performed better than all 3 comparable brands with little to no residual dye remaining on the tips (Figure 3).



**Figure 3.** Visual comparison of liquid retention by various pipette tips. From left to right in sets of two: Control PP, Axygen MaxRecovery+, Comparable A, B, and C.

## Conclusions

Axygen® MaxRecovery+™ pipette tips effectively reduce the volume of residual solution remaining within the tips with a retained volume of less than 1%, making it an excellent choice for assays requiring high precision and accuracy or for minimizing sample loss during liquid handling.

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