

Purpose: To provide guidance on how to obtain optimal performance from PermeGear Pipette Tips

Scope: This procedure applies to pipettes which are used with PermeGear Pipette Tips for sampling.

Detail: PermeGear Pipette tips allow users to pull samples using a pipette rather than a syringe. However, additional flow restriction is created, due to the design of the pipette tip. This can have an effect on the volume delivery of the pipette and must be accounted for. The following procedure is recommended for each pipette using the PermeGear Pipette tips.

Users should take care to note the following points to ensure good performance:

- Ensure the pipette tips are securely assembled. This can be done by pressing the two parts into each other and gently giving a quarter turn as if screwing them together. This will help ensure leaks do not affect the delivery volume.
- When filling the pipette tip, ensure the liquid has stopped moving before removing the tip from the liquid source. This will help to ensure consistent volumes.
- When dispensing, ensure the plunger is completely depressed to remove as much liquid as possible from the pipette tip.

Procedure:

- 1) Perform a volume determination for the intended sampling volume on a pipette using a standard pipette tip. A replicate of 10 measurements is recommended. Obtain an average delivery volume.
- 2) Perform 3 volume evaluations at the same pipette setting using PermeGear Pipette tips. Obtain an average volume delivered. This will be lower than the set point.
- 3) Adjust the pipette volume up by the difference between the average volumes obtained in step 1 and 2. For example, if the volume was set to 200 μL and the difference between steps 1 and 2 was 40 μL , then the new setting should be 240 μL .
- 4) Perform 3 volume evaluations at the new setpoint.
- 5) Repeat the volume adjustments as necessary to obtain the correct setpoint for the desired delivery volume.
- 6) When the desired delivery volume is obtained, perform a series of 10 volume evaluations to ensure the volume is delivered consistently

Pipette Volume Calibration

- 1) Pull of the cap on top of the plunger
 - a. NOTE: This may take a fair amount of force.
Do NOT twist the instrument while pulling the cap off.



- 2) Using the calibration tool, insert the wide end into the 2 slots of the cap on the plunger assembly. Rotate it, at the base, counter-clockwise to unlock and remove the cap.

- 3) Flip the tool around, and slide it over the plunger shaft. Gently rotate the center of the tool it until it locks into place.

- 4) Rotate the outer ring of the tool until it locks into place.



- 5) While holding the outer ring, twist the center of the tool to adjust the accuracy of the tool.
 - a. NOTE: It is important to hold the outer ring firmly, otherwise the target volume will change.
 - b. Rotate the center of tool counter clockwise to increase the delivery volume.
 - c. Rotate the center of the tool clockwise to decrease the delivery volume.
 - d. NOTE: The instrument can be tested for accuracy while disassembled. Temporary re-installation of the cap is recommended.
 - e. NOTE: If the accuracy is within 2 μL of the target, further adjustment is unlikely to improve the accuracy significantly.

- 6) When the volume appears to accurate, remove the tool from the pipette
- 7) Flip the tool over and re-install the cap by pressing it into place and gently rotating clockwise.
- 8) Press the cap back onto the plunger shaft.
- 9) It is strongly recommended that a low and high volume with a minimum of 3 replicates each be performed on the pipette to verify the calibration is accurate