



LEAK CHAMBER VOLUME MEASURING PROCEDURE

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1 Purpose

When leak testing straws for quality control purposes, the volume of the leak chambers is necessary for the calculation of the straw leak rates. Thus, the chamber volumes must be determined. This is achieved by injecting measured amounts of CO₂ (0.1—0.8 mL) into a chamber, and measuring the change in CO₂ ppm level read by the sensor. By fitting the ppm change-CO₂ injection data to a line, it is determined what volume corresponds to one-millionth of the chamber volume, and the chamber volume may then be easily calculated.

2 Instructions

- Pick a row of chambers to test. Flush each chamber for 20 seconds with N₂. Close off N₂ valve on leak chamber, and immediately plug leak chamber with CO₂ injection plug.
- Let chambers sit for two minutes to equilibrate. Now, for the N^{th} row of chambers, open `Run_Background_RowN.py` from the desktop. When prompted, enter 0.1 for 0.1 mL. Let the program run for (5 ± 0.25) minutes.
- After the 5 minute mark, take the CO₂ syringe, insert the needle directly into the CO₂ tank hose (while the tank is open), and push the plunger in and out 2—3 times. Now, slowly pull the plunger back until its bottom is at 0.1 mL
- Inject 0.1 mL of CO₂ into the chamber. After injecting into the last chamber, let the program run for (7 ± 0.25) minutes.
- Close the program. Inject an additional 0.7 mL of CO₂ into each chamber to reach 0.8 mL of CO₂. Wait 2 minutes after injecting into the last chamber.
- Double-click on `Run_Background_RowN.py` and enter 0.8 for 0.8 mL into the program. Let run for (5 ± 0.25) minutes. Close the program.
- Repeat for the combinations of 0.2&0.7 mL, 0.3&0.6 mL, and 0.4&0.5 mL.