



EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

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Formaldehyde Sampling Protocol

Use of Buck Libra L- 4 Pump, Tubes and Universal Low- Flow Adapter;

Low-Flow Sampling (<1 lpm):

- 1) Review the NIOSH Method prior to beginning; <http://www.cdc.gov/niosh/nmam/pdfs/2016.pdf>
OSHA's Technical Manual may be helpful too; http://www.osha.gov/dts/osta/otm/otm_ii/otm_ii_1.html
 - 2) Review the operating instructions for the Buck Libra L- 4 pump, in your kit;
 - 3) Charge and check out the pumps the day **before** sampling to ensure that the pump is fully charged prior to usage;
- Note:** Formaldehyde media is shipped cold and should be kept that way except during sampling period.
- 4) Place the cooler and ice pack in the freezer so they are ready to ship back;
 - 5) DO **NOT** alter the charging apparatus as the battery may be damaged;
 - 6) Assemble the equipment as shown below;



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Buck Libra Pump



Tygon Tubing



Universal Low-Flow Adaptor

6) Assemble the sample train. The tubing attaches to the pump inlet, the low-flow adaptor attaches to the tubing; the clear tube shield is then unscrewed to access the tube fitting. The sorbent tube will then be inserted into the soft rubber tube fitting;

7) Immediately before sampling, break off the ends of the flame-sealed tube so as to provide an opening that is approximately half the internal diameter of the tube;

Note: Wear eye protection when breaking ends and do **not** use the charging inlet or the exhaust outlet of the pump to break the ends of the tube;



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8) Insert the tube into the black rubber fitting on the low-flow adapter as shown, with the arrow pointing towards the tubing. The sorbent is close to one end of the tube, this is the end that should go towards the sampling pump. The tube shall be held or attached in an approximately vertical position with the inlet either up or down during sampling;



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9) Turn the pump on (the LED light should turn on and you should hear the motor) – if it sounds like the motor is strained or frantic, you may have kinked the sample line or forgotten to break the ends off of the sorbent tube (see step # 7);

10) Insert the open end of the tube into the tubing connected to the top fitting of the rotameter (flowmeter);



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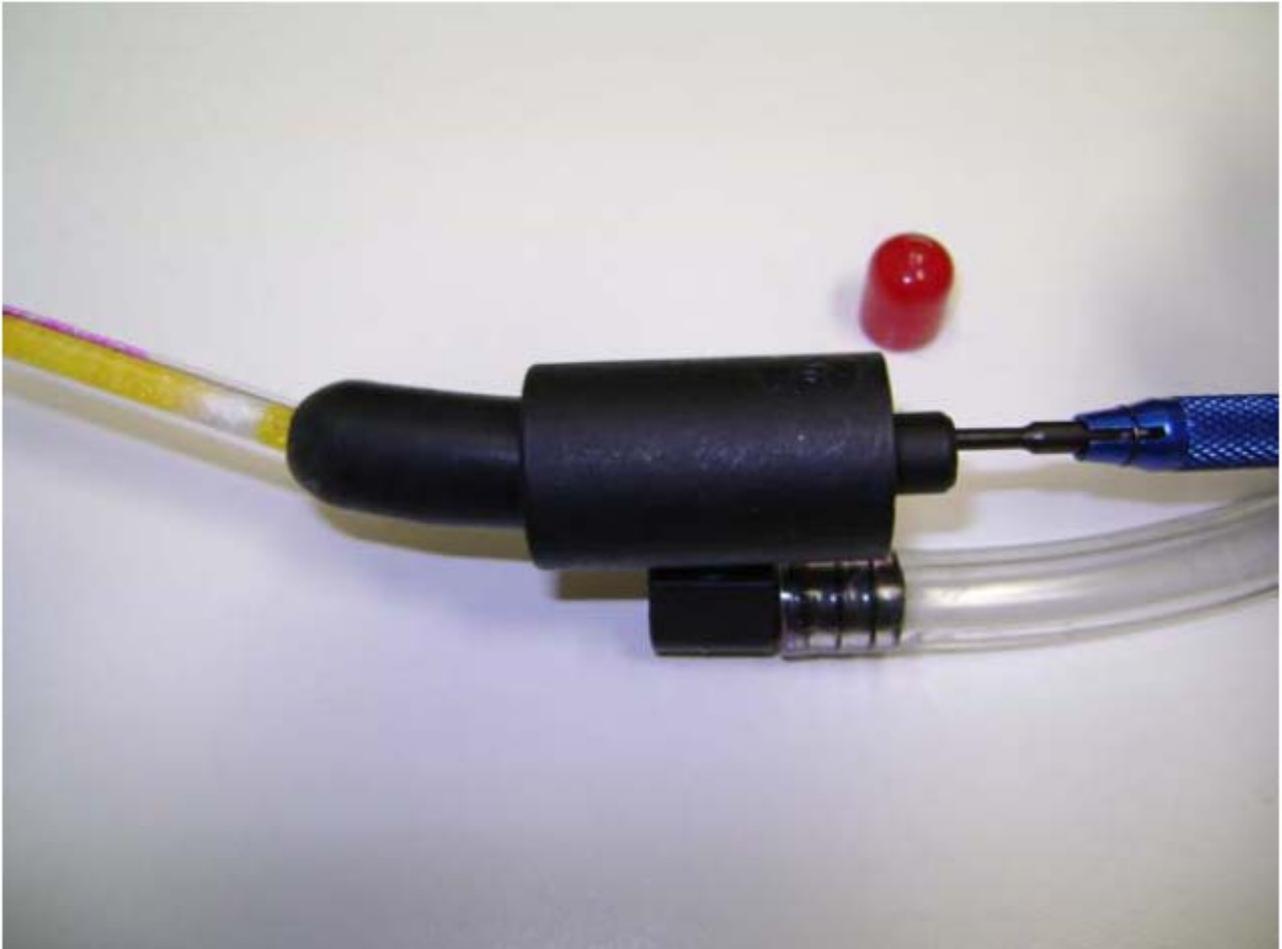
...and read the flowrate. It should be between 0.05 and 0.5 Liters per minute (lpm), the **OPTIMAL** flowrate is **0.3 lpm**. If it is not at 0.3 lpm, carefully use a small screwdriver to adjust the flow using the screw on the low-flow adapter **FIRST**;

Note: This should be attempted prior to making an attempt to adjust the flowrate using the arrows on the front of the pump.



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The adjustment arrows on the front of the pump should be used only after the following the steps outlined above. The pump flow can be adjusted by holding down the “**SET**” button and pressing the up or down arrow;



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11) Place the pump in the area or on the person whose exposure level will be monitored and document the time that the sampling began. If a personal sample, place the open end of the tube as close as feasible to the worker's breathing zone. When taking area samples, note the position of the tube inlet on your notes.

Note: Do **not** let tube drop onto the ground or into liquids.

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12) Periodically check to ensure that the pump is running. A pump that has failed and was left unattended during the sampling period will need to be discarded;

Note: It is important to ensure that the pump is operational for the entire duration of the sampling event.

13) When the sample period is completed, stop the pump by pressing the On/Off switch;

14) Document the time;

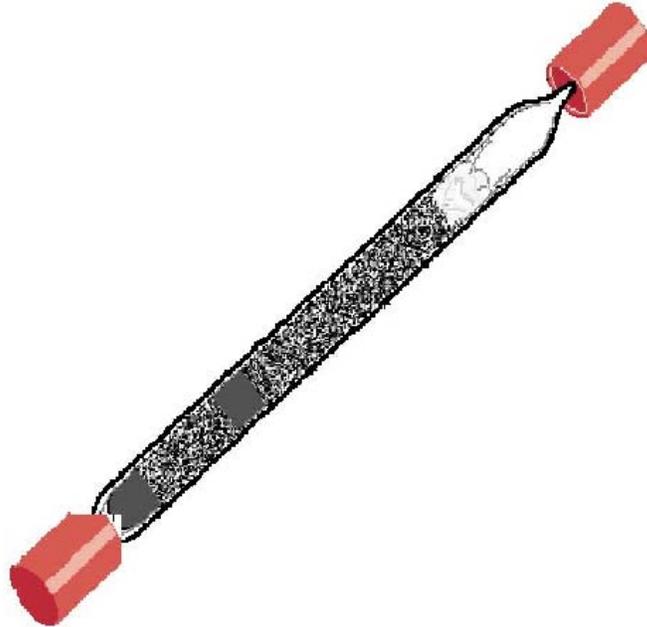
15) Take the tube out of the low-flow adapter and place a red plastic cap on each end and label the tube using a folder label or piece of tape on the end cap **ONLY**;



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16) Complete the Chain of Custody (COC). Indicate the analyte desired (in this case, formaldehyde), flowrate, sampling time in minutes, and the expected turnaround (TAT), etc. Put the tubes back into the cooler with the ice pack for shipment.

Note: If not shipping immediately, put the tubes, cooler, and ice pack in the freezer until you are ready to ship it overnight to EMSL;

17) Send the pumps and tubes back to EMSL for Laboratory Analysis.