

# SAMPLE SETUP GUIDE



## Sampling Train — Two Tubes in Series

Sorbent tube sampling is the NIOSH/OSHA-approved method for collecting most hazardous gases and vapors from the air. The sorbent tube is glass with breakable end tips and contains a specially prepared high-activity sorbent. Most tubes have two sections: one for sample collection and the other for backup. This configuration provides a check against saturation of the primary sorbent bed. Some methods specify two separate tubes connected in series. This allows the primary sorbent to be separated from the backup to prevent sample migration during storage and transport. This Sample Setup Guide illustrates how to set up a **Sampling Train Using Two Sorbent Tubes Connected in Series**.

### Required Equipment

1. An **air sample pump** capable of sampling at the recommended flow rate with the sampling medium in line, such as:
  - SKC Pocket Pump TOUCH with Low Flow Tube Holder Cat. No. 222-3 Series
  - SKC AirChek® Series with All-in-One Low Flow Adapter/Holder Cat. No. 224-27
2. An **airflow calibrator** such as:
  - SKC Low Flow chek-mate Calibrator Cat. No. 375-00205N
  - SKC chek-mate Calibrator with CalChek Cat. No. 375-0550N
3. The **sorbent sample tubes** specified in the method

### Optional Equipment

1. SKC **Tube Breaker** Cat. No. 222-3-50 (for 6 and 7-mm OD tubes) or 222-3-51 (for 8 and 10-mm OD tubes)

### Introduction

For low flow Pocket Pump TOUCH, use a single low flow tube holder. For AirChek Series pumps, use the All-in-One low flow adapter/holder to sample flow rates below 1000 ml/min. To determine the correct flow rate for the chemical of interest, refer to the appropriate analytical method. See the operating instructions for the pump to ensure that it can sample at the correct flow rate.

### 1. Preparing the Sorbent Tubes

Select two appropriate sorbent tubes. These tubes will be used for calibrating the flow and not for collecting the sample. Using a tube breaker, break off both ends of each tube to provide an opening of at least one-half the internal diameter of the tube.

### 2. Setting Up the Calibration Train with All-in-One Low Flow Adapter/Holder — Figure 1

If using an AirChek Series Pump, use the All-in-One. With flexible tubing, connect the holder to the sample pump inlet. Place one sorbent tube into the black rubber sleeve of the holder. The printed arrow on the sorbent tube shows the direction of airflow and should always point toward the holder. If there are no arrows on the tubes, insert the end of the tube with the smallest sorbent section (backup section) into the holder. Using a short piece of PTFE tubing, connect the second sorbent tube to the first tube so that both tubes are oriented in the same direction.

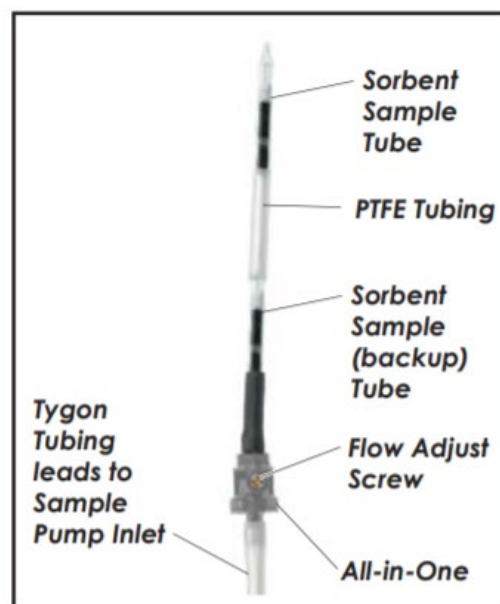
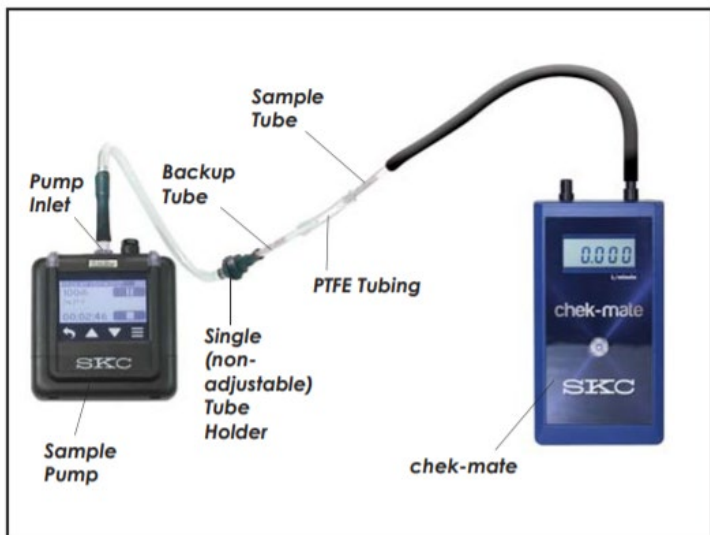


Figure 1. Two tubes in series with All-in-One low flow adapter/holder

### With Single (non-adjustable) Low Flow Tube Holder — Figure 2

If using a low flow pump, connect a single low flow tube holder to the pump inlet with flexible tubing. Place one sorbent tube into the black rubber sleeve of the tube holder. The printed arrow on the sorbent tube shows the direction of airflow and should always point toward the tube holder. If there is no arrow on the tube, insert the end of the tube with the smallest sorbent section (backup section) into the tube holder. Using a short piece of PTFE tubing, connect the second sorbent tube to the first tube so that both tubes are oriented in the same direction.



**Figure 2. Calibration train using single (non-adjustable) low flow tube holder**

### 3. Calibrating the Flow Rate — Figure 2

Allow the pump to equilibrate from one temperature extreme to another and to run for 5 minutes before calibrating. To calibrate the flow rate, connect the exposed end of the outer representative sorbent tube to an external calibrator. Calibrate to the flow rate specified in the analytical method for the chemical of interest. If using an All-in-One (Figure 1), use the flow adjust screw on the holder to adjust flow rate. See the pump and calibrator operating instructions for calibrating the flow rate. When the flow rate has been calibrated and verified, remove the two sorbent tubes used to calibrate the flow and set them aside. These tubes will be used to verify the flow rate after sampling. Record the pre-sample flow rate.

### 4. Sampling

When ready to start sampling, break off both ends of two new sorbent tubes and connect them in the same manner used to calibrate the flow rate. Insert one sorbent tube into the rubber sleeve of the low flow tube holder or the All-in-One with the smallest sorbent section situated in the tube holder. Using a short piece of PTFE tubing, connect the second sorbent tube to the first tube so that both tubes are connected in series and oriented in the same direction. (**Note: It is good practice to use inert PTFE tubing.**) In most cases when two tubes are used in series, a protective tube cover does not fit over the tubes. Attach the clip of the tube holder to a worker's collar and attach the pump to the worker's belt. The sorbent tubes should be oriented in a vertical direction during sampling. Turn on the pump and record the start time and other sampling information.

### 5. After Sampling

At the end of the sampling period, turn off the pump and record the ending time. Remove both sorbent tubes, seal the ends of the tubes with the caps provided, and record pertinent sampling information. The leading tube is designated as the sample tube, while the rear tube is the backup tube. Ensure that these tubes are properly labeled.

Using a calibrator, calibrate the flow rate with two representative sorbent tubes in line to verify that the flow has not changed by more than 5%.

Submit field blanks from the same lot number as the sample tubes. Field blanks should be subjected to exactly the same handling as the samples (break, seal, and transport) except that no air is drawn through them.

Pack the sample sorbent tubes, field blanks, and all pertinent information securely for shipment to a laboratory for analysis.

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