

SAMPLE SETUP GUIDE

Sampling Train — Two Tubes in Series

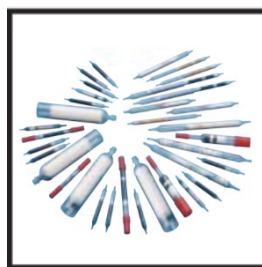
Sorbent tube sampling is the NIOSH/OSHA-approved method for collecting most hazardous gases and vapors from the air. The sorbent tube is glass with breakable end tips and contains a specially prepared high-activity sorbent. Most tubes have two sections: one for sample collection and the other for backup. 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® Touch Series with All-in-One Low Flow Adapter/Holder Cat. No. 224-27
2. A **flowmeter** such as:
 - SKC Low Flow chek-mate® Flowmeter Cat. Nos. 375-00205N, 375-00205, and 375-00205S
 - SKC Medium Flow chek-mate with CalChek Cat. Nos. 375-0550N, 375-0550, and 375-0550S
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 Touch 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 pump operating instructions 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 verifying 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 Flow Rate Verification Train with All-in-One Low Flow Adapter/Holder — Figure 1

If using an AirChek Touch 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.

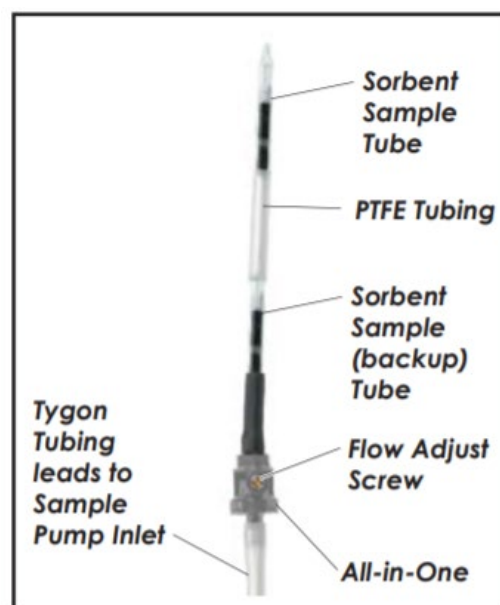


Figure 1. Two tubes in series with All-in-One low flow adapter/holder

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.

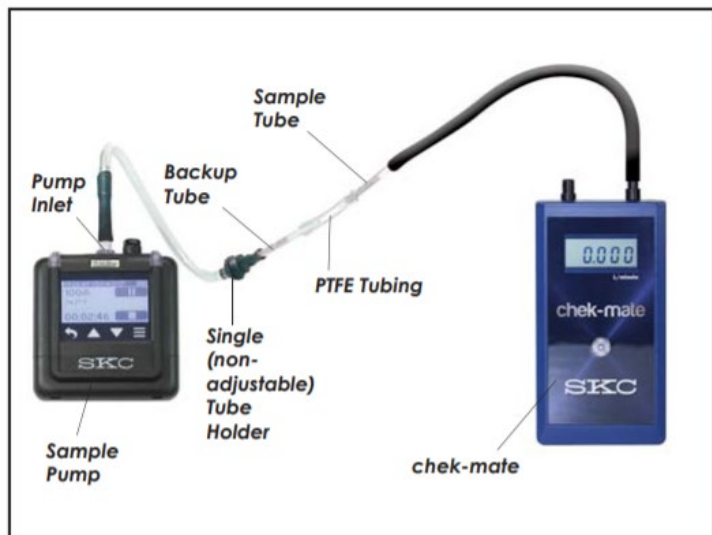


Figure 2. Flow rate verification train using single (non-adjustable) low flow tube holder

3. Verifying the Flow Rate — Figure 2

Allow the pump to equilibrate from one temperature extreme to another and to run for 5 minutes before flow rate verification. To verify the flow rate, connect the exposed end of the outer representative sorbent tube to a flowmeter. Verify that the flow rate is as 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 flowmeter operating instructions for flow rate verification. When the flow rate has been adjusted and verified, remove the two sorbent tubes used for flow rate verification 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 verify 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 flowmeter, verify the flow rate with two representative sorbent tubes in line to ensure 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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