

# SAMPLING INSTRUCTION SHEET # SIS.4009.03

## Pressurized Gas Sampling Using a Particle Filter Assembly

Revision No. 3

Date: 10 April 2018

### Introduction

Atlantic Analytical Laboratory (AAL) provides pre-cleaned, ready-to-use particulate sampling units as a convenience to our customers. These standard units are equipped with a tared 22mm 0.45-micron PTFE filter patch in a tape-sealed filter cartridge. If required, a 22mm 0.85-micron cellulose ester filter patch or a 22mm 10-micron pore size filter patch can be employed. These filter units are rated for 2 - 200 psig service. Valve port fittings are 1/4" NPT. Customers must supply their own vent tubing for safe outside venting of gases.

### Safety

Before sampling, review all MSDS information related to the gases present. Always wear safety glasses, protective gloves, and other necessary safety equipment. Particle filter assemblies are only to be used by personnel trained in handling pressurized gases. For safety, always assume any cylinder or gas line contains the maximum amount of pressure possible in the system. Whenever possible, ensure that the particle filter assembly outlet port is attached to an appropriate vent line to avoid a potentially hazardous buildup of the gas being sampled, especially for oxygen, flammable gases, and when sampling in a confined space.

**Refer to the back of this page for a diagram of a typical sampling setup.**

- **DO NOT** sample toxic, corrosive, pyrophoric, or extremely reactive gases with these filter assemblies.
- **DO NOT** exceed the **maximum inlet pressure (200 psig)** or **flow rate (50 SLPM)**.

### Equipment

Particle filter assembly, Tubing caps, Wire-tie ID tag, Zip-lock bag.

### Sampling Procedure

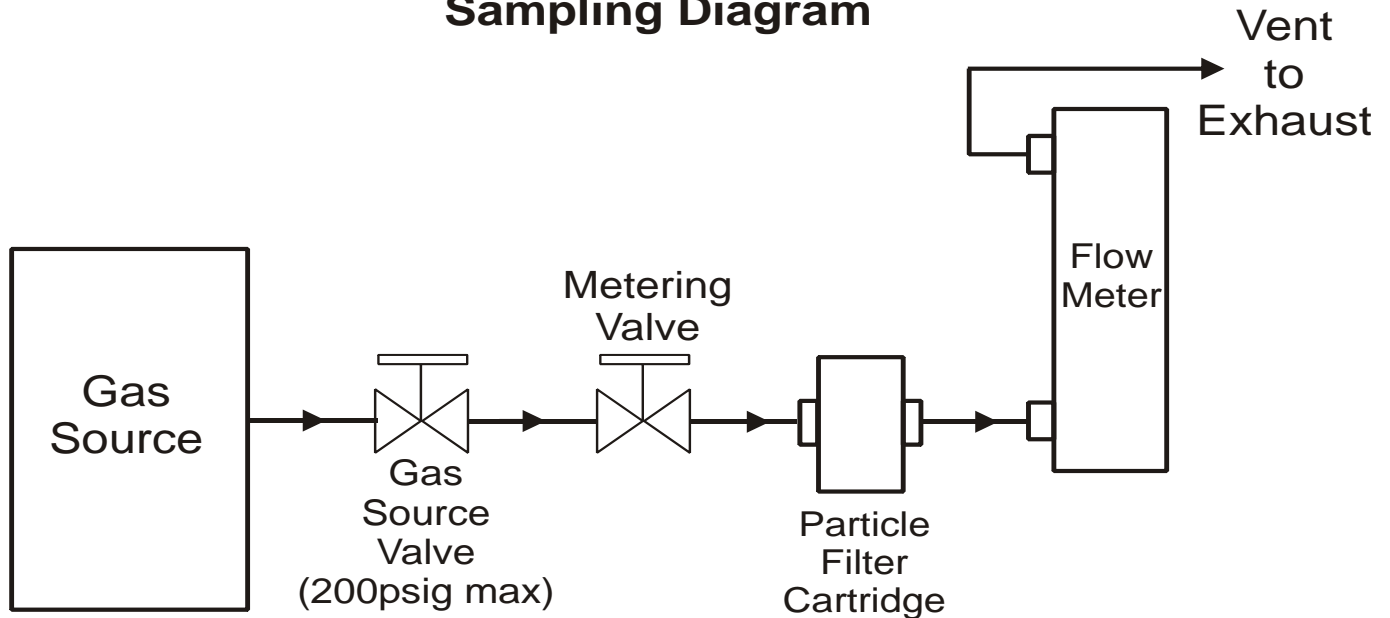
- 1) Purge the gas source briefly before connecting the filter assembly. Use a vent line piped to exhaust if sampling flammable gas or sampling in a confined space. Clean the gas source, tubing, and fittings of all moisture, oils, and particulates.
- 2) Ensure the gas to be sampled is regulated to **below 200 psig** at the sampling point; otherwise, the filter may tear or the assembly may become dangerously over pressurized.
- 3) Remove the filter assembly from the zip-lock bag, make sure the metering valve is closed, then remove the end caps and store them in the zip-lock bag.
- 4) **IMPORTANT:** Use caution if using PTFE tape on the threads of the fittings connecting to the filter assembly. Thread tape may shred and collect on the filter patch; to prevent this ensure the threads are not tape-wrapped past the leading edge of the fitting.
- 5) Connect the filter assembly to the gas source via the 1/4" NPT fitting and tighten the connection ensuring a gas tight seal. Make sure the filter assembly flow meter is in a fully vertical position. Connect a vent line piped to exhaust to the outlet of the flow meter if sampling flammable gas or sampling in a confined space.
- 6) Open the gas source valve and then slowly open the filter assembly metering valve.
  1. Adjust the metering valve until the center of the flow meter ball is at the recommended 33 LPM setting.
  2. Start a timer. Record the flow setting and start time on the sample ID tag.
  3. Check the flow setting several times during testing to make sure it is constant.
  4. Sample the gas for at least 30min (longer times if practical).
  5. The minimum optimal sampling volume is 1 cubic meter of gas = 1,000 liters. This is usually accomplished by sampling at 33LPM for 30 minutes (~990 liters). Other combinations of flow rate and time can be used to achieve this volume, for example 20 LPM for 50 minutes, 50 LPM for 20 minutes, etc. **Do not exceed 50 LPM** or the filter patch may tear.
  6. Larger sampling volumes can be collected to allow lower detection limits, usually accomplished by increasing sampling times (several hours, overnight, etc).
  7. For gases other than air or nitrogen, the final flow rate will have to be calculated using a correction factor based on the flow tube used and the specific type of gas being tested.

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## Sampling Procedure (continued)

- 7) After the sampling period, close the filter assembly metering valve and stop the timer. Record the final flow rate and completion time on the sample ID tag.
- 8) Shut off the gas source. Disconnect the filter assembly and replace the end caps.
- 9) Record all sample information including gas type on the sample ID tag and place the filter assembly in the zip-lock bag until the filter patch analysis can be performed.

## Sampling Diagram



## Particle Filter Assembly



***Proper sampling technique is the most critical step in any gas analysis program.  
Please feel free to contact us at any time if you have questions.***