

# Gas Flow Constant Calibration Worksheet

Follow the instructions for calibrating the analyzer's Mass Flow Controllers for a given gas. Use worksheet to record measured values and perform calculations included in this process.

## Single Gases

MFC being used (optional)

\_\_\_\_\_ Preparation

\_\_\_\_\_ Carrier

\_\_\_\_\_ Analysis (Loop)

Gas: \_\_\_\_\_

1. MFC flow rate (as set on instrument schematic): \_\_\_\_\_
2. Measured flow rate (using an external flow meter): \_\_\_\_\_
3. Convert the flow rate to Standard Temperature and Pressure (STP) using the following formula:

$$\text{Rate at STP} = \text{Rate measured (cm}^3) \times \frac{273.15K}{273.15K + \text{room temp } ^\circ C} \times \frac{\text{atmospheric pressure}}{760mmHg}$$

Measured rate at STP: \_\_\_\_\_

4. Enter the value from line 3 in the Actual flow field of the Gas Flow Constant Calibration window (**Unit [n] > Gas Flow Calibration**).
5. The new Mass flow constant displays. Enter the Mass flow constant value: \_\_\_\_\_
6. Click Accept.
7. Enter the new Conversion Constant for this gas (from line 5) into the Adsorptive Properties (.ADP) file.

## Gas Mixtures

A conversion constant for a mixture of gases can be determined using the conversion constants for each gas in the mixture. Use the following formula to calculate the conversion constant for the gas mixture:

$$M = \frac{1}{\left[\frac{P_1}{F_1 \times 100}\right] + \left[\frac{P_2}{F_2 \times 100}\right] + \dots + \left[\frac{P_n}{F_n \times 100}\right]}$$

where

M = mixture conversion constant

P = percentage of gas n in the mixture, expressed as a whole number (example: for 15%, use 15, not .15)

F = conversion constant (factor) for gas n

| Gas Name (n) | Conversion Constant (F) |
|--------------|-------------------------|
| 1.           |                         |
| 2.           |                         |
| 3.           |                         |
| 4.           |                         |
| 5.           |                         |
| 6.           |                         |
| 7.           |                         |
| 8.           |                         |
| 9.           |                         |
| 10.          |                         |
| 11.          |                         |
| 12.          |                         |
| 13.          |                         |
| 14.          |                         |
| 15.          |                         |

Mixture name: \_\_\_\_\_

Constant (M): \_\_\_\_\_