

Application Notes:

Calibrating Cyclones with Bios Defender™

Calibration jars are commonly used in the calibration of personal air sampling pumps for size-sensitive particulate sampling. A calibration jar is simply a plastic jar used to house a cyclone or other size-sensitive filtration element. The sampling pump is connected via a representative section of tubing to the filtration element, and then the filtration element is connected to the primary standard by only the minimum length of tubing necessary.

We don't recommend the use of calibration jars with our Bios primary standards (for example, the Bios Defender™ or the DryCal® DC-Lite), as jars are not metrologically-sound by nature (they are not air-tight) and typically introduce undetectable air leaks, resulting in additional measurement error. Additionally, calibration jars insert large gas volume, or "dead" inventory volume, between the filtration element and the standard, introducing further measurement error.

To accurately calibrate cyclones using our Defender or another Bios primary standard, we recommend one of the following methods:

- Connect the pump directly to the Defender's outlet via a typical section of tubing. Then, connect the cyclone-filter to the Defender's inlet with only the minimal length of tubing necessary. Next, set the Defender to take at least 20 flow measurements in the average in order to average out the flow variations caused by direct connection of the pump to the calibrator
- Calibrate using the NIOSH Alternate Calibration Method entitled, "Jar-less Cyclone Calibration" and per NIOSH Manual of Analytical Methods (NMAM)



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