

Mercury Spill Response Instrumentation

Mercury Vapor Analyzers

- Jerome 431-X MVA (gold film)
- Lumex 915+ MVA (Atomic Absorption)
- Jerome J405 MVA

Jerome 431-X Mercury Vapor Analyzer

■ Capabilities:

- Detects mercury vapor at the $\mu\text{g}/\text{m}^3$ level and greater
- $3.0 \mu\text{g}/\text{m}^3$

■ Limitations:

- May not detect mercury at lower levels
- 7 pounds

■ Uses:

- Mercury spills such as thermometers, hydrometers, switches, pressure gauges



Advantages vs. Disadvantages

- Has a high maximum reading value
- Does not saturate easily
- Can always be reset with the Regen function
- Is not a constant read type of instrument
- Has a detection limit above the lowest health-based cleanup level
- Reproducibility is low at low concentrations

Useful places for a Jerome

- Screening bagged personal items.
- Searching for hotspots in a high ambient concentration area.

Jerome J405 Mercury Vapor Analyzer

By Arizona Instrument, LLC

■ Capabilities:

- Uses Gold Film Sensor Technology
- Detects mercury vapor at the $\mu\text{g}/\text{m}^3$ level and greater
- $0.5 \mu\text{g}/\text{m}^3$ to $999 \mu\text{g}/\text{m}^3$
- 16 seconds for sample
- 5.3 pounds
- 20,000 samples
- Data Logging (USB)
- 24 hour battery life

■ Uses:

- Meets EPA and ATSDR Action levels.



Lumex 915+ Mercury Vapor Analyzer with RP-91 and RP-91C Attachments

■ Capabilities:

- Portable Atomic Absorption
- Instant NIOSH 6009 indoor air Hg concentrations
- 2 ng/m^3 ($0.002 \text{ } \mu\text{g/m}^3$)

■ Limitations:

- Soil and liquid attachments require field lab setup
- Standards are expensive and difficult to ship quickly (DG)
- 16 pounds



- Direct analysis of soil and complex mixtures (EPA 7473)
- Hg determination in aqueous samples (EPA 1631)

Advantages vs. Disadvantages

- Constant read instrument
- Extremely low detection limit
- Generally accurate and reproducible at low or high concentrations
- 20 minute startup time
- Battery life, especially through the length of a removal
- High background concentrations may hide hotspots, or saturate the instrument

Spikes

- When using the Lumex and a high reading occurs, remove instrument to outside or away from area to clear.
- If clearing personal items, watch the numbers and as soon as they go above 25,000 ng/m³ remove the nozzle. Use a Jerome to get exact values if they are needed

More About Spikes

- In a very high environment the numbers may go up very quickly and then begin coming down, then when the nozzle is moved back to clear air the numbers will rise and then fall back down.
- This means the concentrations saturated the detector and the Lumex will likely take additional time to clear.

Two types of measurements

■ Ambient air concentrations

- Measured in the 4 – 6 ft height region.
- Tells you the concentration of mercury vapor in the room as a whole.
- This is similar to the data gained with air sampling.
- Always performed first.

■ Near surface measurements

- Performed near a surface (floor, tabletop, etc.).
- Delineates hot spots, where elemental mercury may be.

Questions???

