



## Operating Instructions for Mercury Monitor Part# 380018-10

### Technical Summary

#### Physical Specifications:

Dimensions	10.5cm x 5.5cm x 0.25cm
Weight	11g
Refrigerated shelf life	1 year
Color Change	white to purple

#### Sampling Parameters:

Exposure range for:	
Badge	0.125 - 1.6 mg/m <sup>3</sup> x hr
Badge used with color comparator	0.12 - 3.2 mg/m <sup>3</sup> x hr
Maximum recommended sampling time	12 hours
Minimum recommended sampling time	15 minutes
Relative humidity range	10% - 85%
Face velocity range	5 - 150 cm/sec
Temperature range	12 - 39°C (54 - 102°F)
Mean coefficient of variation	±7.66
Bias at ambient conditions	5.87%
Light effect - UV (direct sunlight)	not recommended
Light effect - visible	no effect

#### Applications:

The ChromAir mercury badge may be used for personnel or area monitoring for exposure times ranging from 15 minutes to 12 hours. For higher resolution, the ChromAir mercury badge may be used in conjunction with the ChromAir hydrogen sulfide color comparator (part number: 384003).

#### Cross Interferences:

The ChromAir mercury badge was treated in atmospheres containing at least two times the OSHA PEL for the following substances: alcohols (methanol and ethanol), aromatic hydrocarbons (benzene, toluene and xylene), halogenated hydrocarbons (chloroform, methylene chloride and carbon tetrachloride), aldehydes, oxidizers (chlorine and bromine) and carbon monoxide. These substances showed no effect on the performance of the ChromAir mercury badge. Arsine, phosphine and other hydrides cause a positive interference. No other interferences are known.

#### Introduction:

Mercury is a silver white, heavy, mobile, liquid metal with no specific odor. It is readily absorbed through the skin, the gastrointestinal tract and the respiratory tract. Chronic exposure may cause inflammation of the mouth and gums, kidney damage, muscle tremors, depression and nervousness. Mercury spills and heated mercury are particularly hazardous. OSHA and NIOSH exposure limit for mercury is 0.05 mg/m<sup>3</sup> (TWA).

Mercury is used in barometers, thermometers, hydrometers, pyrometers and in mercury arc lamps producing ultraviolet rays. It is also used in pharmaceuticals, agricultural chemicals and antifouling paints.

**Principle of Operation:**

The ChromAir passive monitor is a patented direct read autogenic exposimeter. The device is constructed from five cells attached on one side to a flat indicator layer and on the other side to a series of different diffusive resistances. Mercury gas diffuses to the cells through the different diffusive resistances and reacts with the indicator layer, producing color change from white to purple. The color produced on the indicator layer is a direct measure of the exposure dose. Visual color comparison is achieved by observing the formation of the beige threshold color on the individual cell and reading the corresponding exposure dose.

**Operating Instructions:**

1. Remove the pouch from the refrigerator and allow it to warm to room temperature.
2. Remove the badge from its protective pouch.
3. Enter all pertinent information on the I.D. label before monitoring is started (i.e. name, location, date and start time)
4. For personnel monitoring, attach the badge near the user's breathing zone (i.e. collar) with the front side exposed to the surrounding atmosphere.
5. For area monitoring, attach the badge to a stand and mount in a centralized area with the front side exposed to the surrounding atmosphere.
6. Check the back side of the badge periodically to determine the exposure dose (mg/m<sup>3</sup> x hr).
7. To read the badge, locate the highest level cell with beige threshold color.
8. To obtain the average concentration (ppm) in the surrounding atmosphere, divide the exposure dose (ppm x hr) by the exposure time in hours. Example: If the sampling time is 2 hours and the badge reads 4 ppm x hr, the average concentration is determined by dividing 4 ppm x hr by 2 hr. Therefore the average concentration is 2 ppm.

**Storage:**

The ChromAir mercury monitor should be refrigerated in its sealed bag at all times.

**Benefits:**

1. Accurate Measurements: The ChromAir mercury monitor is designed to react selectively with mercury with minimum interference from other substances. The unique design of the monitor minimizes the effects of different humidities, temperatures and air velocities on the accuracy of the measurements.
2. Applications: The ChromAir monitor may be used for personnel screening and for area monitoring or area mapping.
3. Ease of Use: The ChromAir monitor is a direct read device that gives immediate, on-site results. Use of this device requires minimum training.
4. Cost Effective: The ChromAir mercury monitor offers the user the most inexpensive air sampling solution available.

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