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Introduction:

Ozone is a bluish gas with a pleasant, characteristic odor in concentrations of less than 2 ppm. In higher concentrations, the odor is pungent and irritating. Ozone is a severe irritant to the eyes and the mucous membranes. Long-term exposures will cause pulmonary edema (abnormal fluid build-up in the lungs) and chronic respiratory disease. OSHA and NIOSH exposure limit for ozone is 0.1 ppm (TWA).

Ozone is used as a disinfectant of air and water. It is also used to bleach waxes, textiles and oils.

Principles of Operation:

The B1-L passive monitor is a patented direct-read autogenic exposimeter. The device is constructed from six cells attached on one side to a flat indicator layer and on the other side to a series of different diffusive resistances. Ozone gas diffuses to the cells through the different diffusive resistances and reacts with the indicator layer, producing color change from blue to light blue and finally to white upon high exposure. 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 light blue threshold color on the 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. the 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 and the back side protected from exposure to direct sunlight.
6. Check the back side of the badge periodically to determine the exposure dose (ppm·hr).
7. To read the badge, locate the highest level cell with light blue threshold color.
8. To obtain the average concentration (ppm) in the surrounding atmosphere, divide the exposure dose (ppm·hr) by the exposure time in hours. EXAMPLE: If the sampling time is 2 hours and the badge reads 0.08 ppm·hr, the average concentration is determined by: 0.08 ppm·hr/2 hr. Therefore, the average concentration is 0.04 ppm.

Storage:

The B1-L ozone badge should be refrigerated in its sealed bag at all times.

Benefits:

1. Accurate Detection: The B1-L ozone badge is designed to react selectively with ozone 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 measurements.
2. Applications: the B1-L badge may be used for personnel screening and for area monitoring or area mapping.
3. Ease of use: The B1-L badge is a direct-read device that gives immediate, on-site results. Use of this device requires minimum training.
4. Cost Effective: The B1-L badge offers the user the most inexpensive air sampling solution available.

Physical Specifications:

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

Sampling Parameters:

Exposure range	0.08 – 1.6 ppm · hr
Maximum recommended sampling time	10 hours
Minimum recommended sampling time	5 minutes
Relative humidity range	20% - 90%
Face velocity range	10 – 165 cm/sec
Temperature range	61°F - 86°F
Light effect – UV (direct sunlight)	Not recommended*
Light effect – visible	No effect

Applications:

The B1-L ozone badge may be used for personnel or area monitoring* for exposure times ranging from 5 minutes to 10 hours.

Cross Interferences:

Chlorine does not affect the performance of the monitor. Hydrogen peroxide is a known interference. Up to 0.3 ppm nitrogen dioxide shows no interference. Exposure to 0.5 ppm nitrogen dioxide for 5 hours causes false positive readings equivalent to 0.04 ppm ozone; exposure to 1 ppm nitrogen dioxide for 3 hours causes false positive readings equivalent to 0.04 ppm of ozone. No further interferences are known.