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Warning: Keep out of reach of children, if ingested seek medical attention immediately.



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**Operating Instructions For
Phosgene Monitor
(Part Number: 382000)**

Technical Summary

Physical Specifications:

Dimensions	(74 ± 1 mm) x (41 ± 1 mm) x (1 mm)
Weight	1.5 g
Refrigerated shelf life	1 year
Color change	yellow to red

Sampling Parameters:

Exposure dose:	
Badge	0.9 ppm·min (15 ppb·hr)
Badge with color comparator	0.9 - 100 ppm·min
Badge with color comparator ext. range	0.9 - 450 ppm·min
Minimum detectable limit (8 hours)	0.002 ppm
Maximum recommended sampling time	3 days
Minimum recommended sampling time*	1 minute
Relative humidity range	10% - 100%
Face velocity range	5 - 168 cm/sec
Temperature range	55°F - 99°F
Light effect – UV (direct sunlight)**	no effect
Light effect – visible	no effect
Color stability	4 weeks

* Badge responds instantly to phosgene. However, the shortest experimentally quantifiable exposure sampling time is 1 minute.

** Extensive exposure to direct sunlight will lead to darkening of the background. This may cause difficulty reading exposures less than 5 ppm·min.

Applications:

The SafeAir phosgene badge may be used for personnel or area monitoring for exposure times ranging from 1 minute to 3 days. For higher resolution, the SafeAir phosgene badge may be used in conjunction with the SafeAir phosgene color comparator (part number: 383000) or the SafeAir phosgene extended range color comparator (part number: 383007). The SafeAir phosgene badge may also be used to monitor for methyl chloroformate.

Cross Interferences:

Benzoyl chloride, cyanuric chloride, carbonyl bromide and chloroformates are known interferences. No other interferences are known.

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Introduction

Phosgene is a colorless, highly toxic gas with an odor resembling moldy hay. It is an insidious poison. There is no immediate irritation even when fatal concentrations are inhaled. It may cause severe pulmonary edema (abnormal fluid build up in the lungs) or pneumonia. Inhalation of high concentrations causes choking, coughing and painful breathing. OSHA PEL (permissible) exposure limit for phosgene is 0.1 ppm (averaged over an 8-hour work shift). NIOSH IDLH (immediately dangerous to life or health) exposure limit for phosgene is 2 ppm.

Phosgene is used in the manufacturing of numerous organic chemicals. It is also used in the production of glass, resins, dyes and plastics.

Principle of Operation

The SafeAir phosgene badge is a monitoring system designed to indicate the presence of phosgene at concentrations below the permissible exposure limit. The SafeAir phosgene badge detects the presence of phosgene by forming a color change in the shape of an exclamation mark inside the triangle. This indication is produced by a color-forming reaction, which occurs when phosgene reacts with a flat indicator layer.

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. Remove activation label before monitoring.
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.
6. The exclamation mark appears within the triangle when phosgene is present. Please note that the exclamation mark will appear underneath the printed exposure dose (sensitivity).
7. To obtain the average concentration, divide the exposure dose (ppm·min) by the exposure time in minutes (min).

Storage

The SafeAir phosgene badge should be refrigerated in its sealed bag at all times.

Benefits

1. Accurate Detection: The SafeAir phosgene badge is designed to react selectively with phosgene with minimum interference from other substances.
2. Applications: The SafeAir badge may be used for personnel screening and for area monitoring or area mapping.
3. Ease of Use: The SafeAir badge is a direct-read device that gives immediate, on-site results.

Other Available Monitors

1. SafeAir Badges:

Ammonia	Dimethyl Amine	Nitrogen Dioxide
Aniline	Formaldehyde	Ozone
Aromatic Isocyanates	Hydrazine	Sulfur Dioxide
Carbon Dioxide	Hydrides	UDMH
Carbon Monoxide	Hydrogen Chloride	
Chlorine	Hydrogen Sulfide	
Chlorine/Chlorine Dioxide	Mercury	
2. SafeAir Color Comparators:

Arsine ¹	Diborane ¹	Phosphine ¹
Carbon Dioxide	Hydrazine	TDI ⁴
Chlorine	Hydrogen Chloride	UDMH
Chloroformates ²	MMH ³	

If you require SafeAir monitors for a chemical hazard not listed, please contact Morphix Technologies® for a free compound consultation at (800) 808-2234.

¹ To be used with the SafeAir hydrides badges

² To be used with the SafeAir phosgene badges

³ To be used with the SafeAir hydrazine dual level badges

⁴ To be used with the SafeAir aromatic isocyanates badges