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 buildup 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.

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: 0.5 ppm min (8.3 ppb hr)
- Badge with color comparator ext. range: 0.5 - 450 ppm min
- Minimum detectable limit (8 hours): 0.001 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
- Known Interferences: acyl halides, benzoyl chloride, cyanuric chloride, carbonyl bromide and chloroformates

* 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.

Operating Instructions
1. Allow the badge to warm to room temperature prior to removing the badge from its protective pouch.
2. 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.
3. For area monitoring, attach the badge to a stand and mount in a centralized area with the front side exposed to the surrounding atmosphere.
4. 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).
5. A color comparator is available for use with this badge. To obtain the average concentration, divide the exposure dose (ppm min) by the exposure time in minutes (min).

Warranty Exclusions and Limitation of Liability
IF THE USER DOES NOT ACCEPT THE FOLLOWING TERMS, THE USER SHOULD NOT USE THE SAFEAIR BADGES AND COLOR COMPARATORS.

Seller warrants that, for the lesser of one (1) year or the shelf-life provided on the Seller’s product, its packaging or its literature, its products shall conform to the description of such products as provided on the Seller’s product, its packaging or its literature. THIS WARRANTY IS EXCLUSIVE, AND SELLER MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. Seller’s warranties made in connection with this sale shall not be effective if Seller has determined, in its sole discretion, that Buyer has misused the products in any manner, has failed to use the products in accordance with safe industry standards and practices, or has failed to use the products in accordance with Seller’s written operating instructions, or other instructions furnished by Seller to Buyer.

Seller’s sole and exclusive liability and Buyer’s exclusive remedy with respect to products to Seller’s satisfaction to be defective or nonconforming shall be replacement of such products without charge or refund of the purchase price, in Seller’s sole discretion, upon the return of such products in accordance with Seller’s instructions. All claims must be brought within one (1) year of shipment, regardless of their nature.

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

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