



**Operating Instructions
Carbon Monoxide Badge
(Part Number: 380008)**

Introduction

Carbon monoxide is a colorless, odorless gas. It is a commonly used industrial gas which is both highly toxic and odorless. Symptoms of exposure to carbon monoxide include headaches, palpitations, dizziness, weakness and nausea. Low levels of carbon monoxide in air, which is not immediately hazardous to life, may impair reaction time or sensory perception. Chronic exposure to low levels of carbon monoxide may adversely affect the cardiovascular system. Loss of consciousness and death may result from continued or more intense exposure. OSHA PEL (permissible exposure limit) for carbon monoxide is 50 ppm (TWA). NIOSH REL (recommended exposure limit) for carbon monoxide is 35 ppm (TWA).

Carbon monoxide is a widely spread air pollutant. It is a byproduct in the combustion of gasoline, diesel, kerosene and coal fuel; therefore, carbon monoxide may exist in different industries, residential areas and highways.

Principle of Operation

The ChromAir 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. Carbon monoxide gas diffuses to the cells through the different diffusive resistances and reacts with the indicator layer, producing color change from light brown to brown to black. 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 brown threshold color on the individual cell and reading the corresponding exposure dose.

Physical Specifications:

Dimensions	10.5 cm x 5.5 cm x 0.25 cm
Weight	11 g
Refrigerated shelf life	1 year
Color change	light brown to dark brown/black

Sampling Parameters:

Exposure Dose Range	10 - 525 ppm•hr
Maximum recommended sampling time	48 hours
Minimum recommended sampling time	5 minutes
Relative humidity range	19% - 85%
Face velocity range	10 - 165 cm/sec
Temperature range	10°C - 45°C (50°F - 113°F)
Light effect - UV (direct sunlight)	no effect
Light effect - visible	no effect
Known Interferences	alkenes, hydrogen sulfide, and hydrogen

Operating Instructions

1. Allow the badge to warm to room temperature prior to removing the badge from its protective pouch.
2. Enter all pertinent information on the label before monitoring is started (i.e. name, location, date and start time).
3. Prior to exposure, remove the protective strip from the first cell on the front of the badge.
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 (ppm•hr).
7. To read the badge, locate the highest level cell with brown 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 10 ppm•hr, the average concentration is determined by:

$$\frac{10 \text{ ppm}\cdot\text{hr}}{2 \text{ hr}}$$
Therefore the average concentration is 5 ppm.

WARRANTY EXCLUSIONS AND LIMITATION OF LIABILITY

IF THE USER DOES NOT ACCEPT THE FOLLOWING TERMS, THE USER SHOULD NOT USE THE CHROMAIR BADGES.

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



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