

Resources

Styrene air comparison values

Residential and building occupants:

Cal EPA Office of Environmental Health Hazard Assessment (OEHHA)

- ♦ **Acute** Reference Exposure Level = 4.9 ppmv
- ♦ **Chronic** Reference Exposure Level = 0.2 ppmv

Workers:

- ♦ Cal OSHA Permissible Exposure Level = 50 ppmv (8 hour TWA)
- ♦ ACGIH Threshold Limit Value = 20 ppmv

Air monitoring methods

[USEPA Method TO-14A](https://www3.epa.gov/ttnamti1/files/ambient/airtox/to-14ar.pdf)

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[OSHA Method ORG-09 \(charcoal tube\)](https://www.osha.gov/dts/sltc/methods/organic/org009/org009.html)

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PIDs (photoionization detectors): Use appropriate correction factor and set alarm level.



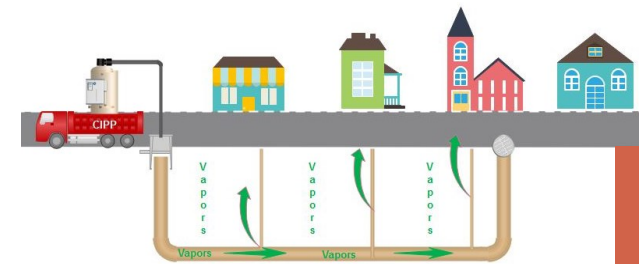
California Department of Public Health Division of Environmental and Occupational Disease Control Emergency Preparedness Team

The Emergency Preparedness Team conducts surveillance of chemical incidents that occur in CA. Through surveillance we identify under-recognized hazards, such as vapor migration during CIPP installation, and work collaboratively with partners to help mitigate exposures and protect public health. We can be reached through the CDPH Duty Officer pager at 916-328-3605.

Prepared by the Emergency Preparedness Team, Division of Environmental and Occupational Disease Control with thanks to San Mateo County, Environmental Health Services for review and feedback.



CALIFORNIA DEPARTMENT OF PUBLIC HEALTH



Cure-In-Place Pipe

CIPP Safety Alert

Vapor Migration Into Buildings

Vapors can migrate into buildings, resulting in exposure to occupants

Background



The use of CIPP for sewer line and culvert rehabilitation is widespread throughout the country and abroad.

There is a possibility of residual chemical releases with CIPP processes. Most of the studies relating to residual chemical releases have focused on environmental impacts from styrene, however migration of vapors and potential impacts on indoor air are also important to consider.

A project involving a large diameter CIPP sewer line installation resulted in styrene vapors migrating into an office building, which exceeded acceptable exposure levels. Building occupants experienced health symptoms.

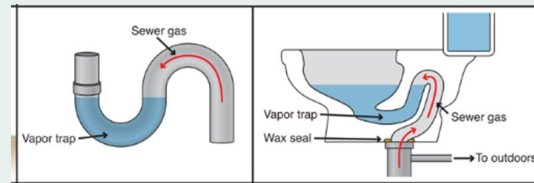
Styrene was measured for up to three months following the CIPP installation.

Styrene health effects

- ◆ Central nervous system depressant.
- ◆ Mucous membrane irritant (upper respiratory tract, eyes, nose and throat).
- ◆ Nervous system effects include headache, fatigue, changes in color vision, concentration and balance problems.
- ◆ Potential to cause cancer.

Recommendations

- ◆ Before sewer rehabilitation begins, provide information to residents and workplaces on the potential for vapor intrusion into the building with suggestions to prevent vapors from entering.
- ◆ Run water in all sinks and basins and cover floor drains.
- ◆ Provide contact number if odors are detected.



Keeping water in traps can reduce vapor migration into buildings

- ◆ Document odor complaints and conduct indoor air monitoring when health symptoms are present.
- ◆ Install a vent at the end of the line.
- ◆ Conduct air monitoring in sewer laterals, especially if work is being done in areas near schools, day care facilities or other sensitive populations.
- ◆ Install a cleanout as described in ASTM F2561-11. It allows the contractor to temporarily plug the lateral service to prevent vapor migration and contaminated discharge water into the lateral.
- ◆ Control steam emissions near schools and places where people gather to avoid exposure to mists.
- ◆ Ensure Safety Data Sheets and chemical information are readily available during the project and after hours.

Concerns during CIPP installation

- ◆ Styrene and other toxic vapors can migrate during **cure-in-place pipe (CIPP)** installation into buildings through laterals, dry p-traps, other compromised plumbing connections, and subsurface voids, resulting in potentially harmful exposure to occupants.
- ◆ Laterals may not be isolated even when sewer lines are bypassed.
- ◆ Curing time for resins used in CIPP can take as long as 6 months.
- ◆ Vapor migration is highly variable due to subsurface conditions, job size, and building characteristics.
- ◆ There is potential for aerosolized contaminants in outdoor air from mist generated during installation.



Photo: Manuel Simoes