

New York State Department of Health

Tenant Notification Fact Sheet for 1,1,1-Trichloroethane (1,1,1-TCA)

This fact sheet is provided to fulfill New York State Department of Health (NYS DOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

1,1,1-Trichloroethane (1,1,1-TCA)

1,1,1-Trichloroethane (also known as methyl chloroform or 1,1,1-TCA) is a man-made volatile organic chemical that was used as a household spot remover, an industrial degreasing agent and an industrial solvent in many products including paints and glues. These uses have been discontinued in the United States because 1,1,1-trichloroethane affects the earth's ozone layer, but limited amounts can be manufactured for export until 2012.

Sources of 1,1,1-TCA in Indoor Air

Household products containing 1,1,1-TCA, such as adhesives and lubricants, are a possible source for 1,1,1-TCA in indoor air. Another source could be evaporation from contaminated well water that is used for household purposes. 1,1,1-TCA may also enter homes through soil vapor intrusion, which occurs when the chemical evaporates from groundwater, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. 1,1,1-TCA has also been found at low concentrations in outdoor air, which can also be a source of the chemical in indoor air.

Levels Typically Found in Air

The NYS DOH reviewed and compiled information from studies in New York State as well as from homes and office buildings across the United States on typical levels of 1,1,1-TCA in indoor and outdoor air. Levels of 1,1,1-TCA are typically around 3 micrograms per cubic meter (mcg/m^3) in the indoor air of homes and office settings, and less than 3 mcg/m^3 in outdoor air.

Health Risks Associated with Exposure

Studies in laboratory animals exposed to 1,1,1-TCA at high levels over their lifetimes have not shown clear evidence that 1,1,1-TCA causes cancer. The ability of these studies to detect cancer effects was limited by study-design weaknesses. Two studies of workers found associations between exposure to 1,1,1-TCA and central nervous system and blood cancers. However, the results are uncertain because the actual number of people who got cancer was very small. Also, workers in these studies were exposed to other solvents, so it is not possible to isolate the effects of 1,1,1-TCA from those of the other chemicals. Therefore, whether or not 1,1,1-TCA causes cancer in humans is unknown. Taken together, the human and animal studies are limited and are inadequate to suggest that long term human exposure to 1,1,1-TCA increases the risk for cancer.

Long term exposure to high levels of 1,1,1-TCA in workplace air is linked to effects on the heart, liver and nervous system. Some humans exposed to large amounts of 1,1,1-TCA over short periods of time have had heart, nervous system and liver damage and mild mucous membrane irritation of the eyes, nose and lungs. Exposure to high concentrations of 1,1,1-TCA damages the liver and nervous system in laboratory animals. Overall, the human and animals studies suggest that exposure to high levels of 1,1,1-TCA may increase the risk for adverse effects on the heart, liver and nervous system.

NYS DOH Air Guideline

The NYS DOH has not established a chemical-specific guideline for 1,1,1-TCA in air. However, NYS DOH guidance for 1,1,1-TCA and other air contaminants is that reasonable and practical actions should be taken to reduce exposure when indoor air levels are above those typically found in indoor air. The urgency to take actions increases as indoor air levels increase. The 1,1,1-TCA exposure levels that cause health effects in animals or humans are many times higher than levels typically found in indoor air.

Ways to Limit Exposure to 1,1,1-TCA in Indoor Air

In all cases, the specific actions to limit exposure to 1,1,1-TCA in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of 1,1,1-TCA and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of 1,1,1-TCA entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that could evaporate into indoor air.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods recommended by the NYS DOH for measuring 1,1,1-TCA in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at concentrations below 1 mcg/m³.

Additional Information

Additional information on 1,1,1-TCA, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYS DOH website at www.health.state.ny.us/environmental/indoors/air/contaminants/.

If you have further questions about 1,1,1-TCA and the information in this fact sheet, please call the NYS DOH at 1-518-402-7800 or 1-800-458-1158 (extension 2-7800), e-mail to ceheduc@health.state.ny.us, or write to the following address:

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