

New York State Department of Health

Tenant Notification Fact Sheet for Vinyl Chloride

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.

Vinyl Chloride

Vinyl chloride is a man-made volatile organic chemical. Vinyl chloride does not occur naturally, but can be formed in the environment from the breakdown of other volatile organic chemicals such as tetrachloroethene, trichloroethene and 1,1,1-trichloroethane. It can also get into the environment as a result of improper waste disposal. Vinyl chloride's primary use is the production of polyvinyl chloride (PVC or "vinyl") plastic. PVC is used in many products including water pipes, wire and cable coatings, packaging materials, furniture automobile upholstery, housewares and toys.

Sources of Vinyl Chloride in Indoor Air

Tobacco smoke, which contains low levels of vinyl chloride, is a possible source for vinyl chloride in indoor air. Another possible source is evaporation from contaminated well water that is used for household purposes. Vinyl chloride 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. Vinyl chloride has also been found at low concentrations in outdoor air, but usually only near industrial facilities that work with vinyl chloride. This could also be source of vinyl chloride in indoor air at some locations.

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 vinyl chloride in indoor and outdoor air. Levels of vinyl chloride in the indoor air of homes and office settings and in outdoor air are expected to be less than 1 microgram per cubic meter (mcg/m^3).

Health Risks Associated with Exposure

Many studies of long-term exposure to high levels of vinyl chloride in workplace air found associations with a rare form of liver cancer. Several health agencies have concluded that these associations are causal and that vinyl chloride is a known human carcinogen. Studies in laboratory animals exposed at high levels over their lifetimes found evidence that vinyl chloride causes several types of cancer, including cancer of the liver, lung, kidney and mammary gland. Taken together, the human and animal studies indicate that long term human exposure to vinyl chloride increases the risk for cancer.

Long term exposure to high levels of vinyl chloride in workplace air is linked to effects on the liver, nervous system and immune system. Some humans exposed to large amounts of vinyl chloride over short periods of time experienced neurological effects such as dizziness, drowsiness and fainting. Exposure to high concentrations of vinyl chloride damages the blood-forming cells, liver, nervous system, male reproductive system and the developing fetus in laboratory animals. Overall, the human and animal studies indicate that human exposure to high levels of vinyl chloride causes effects on the nervous system and that long term exposure to high levels in humans may increase the risk for adverse effects on the liver and the immune system.

NYS DOH Air Guideline

The NYS DOH has not established a chemical-specific guideline for vinyl chloride in air. However, NYS DOH guidance for vinyl chloride and other air contaminants is that reasonable and practical actions should be taken to reduce vinyl chloride 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 vinyl chloride 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 Vinyl Chloride in Indoor Air

In all cases, the specific actions to limit exposure to vinyl chloride in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of vinyl chloride and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of vinyl chloride 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 vinyl chloride 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 vinyl chloride, 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 vinyl chloride 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:

New York State Department of Health
Bureau of Toxic Substance Assessment
Flanigan Square
547 River Street
Troy, New York 12180-2216

New York State Department of Health
February, 2009