

## DESCRIPTION

Lead is a highly toxic naturally occurring element that was used for many years in products found in and around homes. Lead may cause a wide range of adverse health effects including behavioral problems and learning disabilities and in rare cases, seizures and even death. Children 6 years old and under are most at risk because their bodies are growing quickly and can absorb more lead than adults.

Research suggests that the primary sources of lead exposure for most children are:

- Deteriorated lead-based paint.
- Lead contaminated dust.
- Lead contaminated residential soil.

The primary lead exposure pathway for young children and adults is typically different.

For young children, the primary exposure pathway is through ingestion. Children tend to place things into their mouths, therefore if lead is dust present, it is likely to adhere to the hands or other objects placed in the mouth. Children may also chew on surfaces such as windowsills covered with lead-based paint.



In adults, the primary exposure pathway is through inhalation. Manual demolition, scraping, sanding, or using an open flame on painted surfaces can liberate lead dust and fumes that can be inhaled. Welding and torch cutting can also generate lead fumes.



## LEAD IN PAINT

Lead was widely used in paints from the late 1800's until the late 1970s. The highest use of lead in paints was prior to 1950. During the 1950's the quantity of lead in paints slowly decreased as other ingredients became more popular. Lead was first regulated in residential paint in 1972 at 0.5% which is the current federal standard used to define lead-based paint. In 1978, lead in residential paint was banned and must contain no more than 0.06 percent lead by dry weight.

## LEAD IN SOIL

Lead can still commonly be found in bare soils. Typically, the highest concentrations are found around the perimeter of buildings since exterior paints may have been scraped or degraded over time and mixed with the soil close to the building. Soils may also be contaminated with lead that came from emissions from leaded gasoline that was predominately used prior to the mid-1980s. The best practice is to minimize children's direct contact with bare soil. Planting grass and using mulch are good ways to minimize direct contact with contaminated soils.

## LEAD IN WATER

The Philadelphia Water Department (PWD) monitors water for compliance with drinking water standards. They also treat the water to help prevent it from leaching lead from the pipes and solder potentially found in the water supply pipes of older buildings. If it has been several hours since the last time the water was run, a good practice to assure the best possible water quality is

to let it run for two or three minutes (until it turns colder) to flush out any contaminants. The use of the bathtub/shower, flushing toilets, washing machine, etc. will flush the water in the system without wasting it. If there are concerns related to lead in water, PWD has information on how to have your water tested.

## SAFETY STANDARDS

In 1992, the Environmental Protection Agency (EPA) and Department of Housing and Urban Development (HUD) issued the **Residential Lead-Based Paint Hazard Reduction Act** which is often referred to as Title X. Title X set up a program to certify individuals who inspect for lead-based paint and develop lead-based paint risk assessments. The objective was to inspect and mitigate lead-based paint hazards in housing owned by the federal government or that received federal assistance. Title X defined lead-based paint and the criteria used to identify lead-based paint hazards. It also set the requirement to disclose any known information about lead-based paint hazards upon the sale or lease of a property.

The EPA enacted the **Renovation, Repair and Painting Rule** that sets standards for firms performing renovation, repair and painting projects that disturb lead-based paint in homes, childcare facilities, and kindergartens built before 1978 to prevent lead contamination.



The City of Philadelphia enacted the **Lead Paint Disclosure and Certification Law** that requires paint sampling and a risk assessment of rental properties occupied by children 6 and under. The inspection/risk assessment must be performed by an EPA-accredited inspector and a Lead Free or Lead Safe certification must be provided to the tenant and sent to the Philadelphia Department of Public Health.

Employee exposure to lead is covered under Occupational Safety and Health Administration (OSHA) **Lead Standards 1910.1025 (General Industry) & 1926.62 (Construction)**.

The OSHA standards require employers to evaluate employee exposure to lead by completing air sampling while tasks that may potentially release lead are performed. Employees must use the appropriate respiratory protective equipment while performing the task until the exposure is defined.

A very important point is that OSHA considers any amount of lead in paint to be a potential hazard. OSHA does not recognize the EPA/HUD Lead-Based Paint definition. Since adult exposure occurs primarily through inhalation, even very low quantities of lead in paint can be liberated and inhaled depending on how the task is performed. Therefore, only air sampling data representative of the work practices to be used can properly delineate whether there is a lead exposure hazard or not.

This presents just a summary of the many lead standards, regulations and laws that exist. Please see the resources listed below for more information.

## LEAD MANAGEMENT AT PENN

Penn's Environmental Health and Radiation Safety Office (EHRS) maintains the University's Lead Management Program. The program defines roles and responsibilities and procedures to prevent building occupants, visitors, maintenance personnel and contractors from exposure to hazardous levels of lead.

## RESOURCES

- City of Philadelphia Lead and Healthy Homes Program - <https://www.phila.gov/programs/lead-and-healthy-homes-program/>
- OSHA Lead Information - <https://www.osha.gov/SLTC/lead/index.html>
- EPA Lead Programs - <https://www.epa.gov/lead>
- Penn EHRS – Lead Management Plan - <https://ehrs.upenn.edu/health-safety/general-health/lead-management>