

Chemicals and Materials

Lead on Construction Projects

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Where is lead found in buildings?

Lead has been commonly used for many industrial and commercial purposes, primarily because it is widely available, easy to extract, and easy to work with.

Lead can be found in the following materials, among many other sources:

- acoustic dampening baffles
- additive in brass and other alloys
- batteries
- cable and wire casing
- cast iron pipes, gaskets, and connections
- solder (plumbing and electrical)
- indoor firing ranges
- decorative pieces
- flashing
- glazing
- lead glass, stained glass
- late 19th and early 20th century tinted mortar for stone cladding
- paint and surface coatings
- radiation shielding (bricks or sheeting)
- structural steel primer

Please also see the chemical profile on [lead](#) for information on health effects and hazard controls.

How can lead enter the body?

Two routes of entry are of major concern: inhalation and ingestion.

- **Inhalation:** Airborne lead particles in the form of fumes, dusts, and mists can be inhaled deeply into the lungs if they are small enough, such as less than five micrometres (mm) (i.e., five one-millionths of a metre). Larger particles are trapped in the upper respiratory tract, cleared from the lungs, and subsequently swallowed.
- **Ingestion:** This can occur if it gets in your food or drinks or if you eat or smoke without washing your hands first.

A significant portion of inhaled or ingested lead gets into the bloodstream. Once in the bloodstream, lead circulates through the body and is stored in various organs and body tissues. Some of this lead is filtered out of the body and excreted, but some remain in the blood and tissues. As exposure continues, the amount stored will increase if the body absorbs more lead than it excretes. The lead stored in the tissue can slowly cause irreversible damage, first to individual cells, then to organs and whole body systems.

What tasks cause lead exposure?

Exposure to lead can occur in almost any trade. Workers at the highest risk for lead exposure include those involved in iron work, construction, demolition, painting, plumbing, welding, heating and air conditioning, building maintenance and repair, electrical, carpentry, renovation, and remodelling.

Operations with the potential to expose workers to lead include:

- abrasive blasting,
 - demolition, renovation, repair, welding, cutting, burning, application or removal (e.g., by scraping, sanding, heat gun, etc.) of lead-containing paints and surface coatings,
 - lead burning,
 - removing, repointing, or disturbing mortar that contains lead,
 - soldering, and
 - installing or removing lead products (such as lead panels, lead sheeting and lead bricks used for shielding radiation sources).
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How can I control my exposure to lead?

To avoid the ingestion, inhalation, and unintentional transfer of lead from contaminated areas, it is essential to have the following control methods in place:

- elimination and substitution,
- engineering controls,
- administrative controls, including work and hygiene practices, and
- protective clothing and equipment.

It is always best to follow the [hierarchy of controls](#). Some workers may still be affected even with appropriate measures to control lead. For this reason, periodic medical examinations are important to determine if the control measures are effective and if workers are suffering from the effects of lead exposure.

Elimination and Substitution

- Remove lead-based products where possible by using safe work practices when removing or disturbing lead (see engineering controls for examples).
- Substitute lead-containing paints, coatings and materials with lead-free products.

Engineering Controls

Engineering controls include:

- Select methods and equipment for the removal or installation of lead-containing products that will reduce dust generation (e.g., wet methods, such as wet sweeping and shovelling). Local mechanical ventilation should be provided to remove contaminants at the source. For example, power tools that generate lead-containing dust should be equipped with effective dust collection systems.
- General mechanical ventilation should be provided to remove contaminated air from the workplace, and filtered air should be provided to replace the exhausted air.

Administrative Controls: Work and Hygiene Practices

Lead-containing material can accumulate on hands, clothing and hair. From there, it can be disturbed, re-suspended in air, and then inhaled or ingested. Workers should be able to wash and shower at the end of each shift. For all work involving lead exposure, there should be no smoking, eating, drinking or chewing in contaminated areas. Food and beverages should be stored in an uncontaminated area.

An effective housekeeping program requires the regular clean-up and removal of lead-containing dust and debris. Surfaces should be kept clean by washing with water or vacuuming with a vacuum equipped with a high-efficiency particulate air (HEPA) filter. Containers of lead-containing waste should be kept tightly covered to prevent dust from becoming airborne. Cleaning with compressed air or dry sweeping should be avoided.

Protective Clothing and Equipment

Appropriate personal protective clothing and equipment to prevent skin contamination include but are not limited to:

- coveralls or full-body work clothing,
- gloves,
- hats,
- footwear or disposable coverlets, and
- safety glasses, face shields or goggles.

Respirators prevent the inhalation of lead where engineering controls and work practices do not control the concentration of lead to below the occupational exposure limit. Workers should be instructed and trained on the [care](#) and use of personal protective equipment before using it.

If respirators are used, a respirator program should be implemented as part of a [personal protective equipment program](#).

Where respirators are provided, they should be appropriate in the circumstances for the anticipated concentrations of airborne lead. Respirators should be [selected](#) according to the NIOSH-assigned protection factors. Please also see the chemical profile on lead for the current NIOSH respirator recommendation.

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