

MIOSHA Fact Sheet

Lead Exposure in Construction



Lead is a soft bluish-gray metal in its elemental state that is commonly found as an additive in many construction materials. Such materials include but are not limited to paint, welding wire, solders used for soldering tinsplate and copper pipe joints, tank linings and electrical conduit. The Consumer Product Safety Commission has banned the use of lead-based paint in residences; however, because lead-based paint inhibits the rusting and corrosion of iron and steel, lead continues to be used on bridges, railways, ships, lighthouses, and other steel structures. Employee exposures to lead can occur during the demolition, or salvage of structures, during the removal or encapsulation of lead-containing materials, and during new construction, alteration, repair, or renovation of structures that contain lead or lead-containing materials.

Overexposures to lead are commonly found in the construction industry and are a significant cause of illness in the workplace. Exposure to lead can occur through inhalation (breathing), ingestion (eating), and in the case of certain organic lead compounds not covered by the construction standard, absorption through the skin. Employee exposure to lead can result in both acute (short term) and chronic (long term) health effects. Such health effects include insomnia, constipation, nausea, encephalopathy or damage to the central nervous system, anemia, and kidney disease. Exposure can also result in damage to both the male and female reproductive systems (e.g., decreased fertility, sterility, impotence, miscarriage, and still birth). If an employee does not receive proper medical treatment for these conditions, and the exposures to lead continue unchecked, these health effects can become permanent, and may even result in death.

Employer Responsibilities

The Construction Safety and Health Standard [Part 603 Lead Exposure in Construction](#) Standard applies to all construction work operations where an employee may be occupationally exposed to lead. Any employer who has a workplace or operation that is covered by the standard is required to initially determine if employees are exposed to lead at or in excess of the eight-hour Action Level of 30 ug/m³ (micrograms per cubic meter of air). If the work operations include tasks such as spray painting with lead paint, or manual demolition of structures, manual sanding, heat gun applications, power tool cleaning, lead burning, rivet busting, abrasive blasting, welding, cutting, torch burning, cleanup activities where dry expendable abrasives are used or abrasive blasting enclosure movement and removal, where lead coatings or paint are present, the employer is required to provide the affected employees with appropriate interim protection (i.e., respiratory protection, personal protective clothing, change areas, hand washing facilities, biological monitoring, and training) until such time that employee exposures have been determined.

LEO is an equal opportunity employer/program.



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Many of the standard's provisions are triggered by the level of employee exposure to lead. Employee exposures that are at or in excess of the action level, but less than the eight-hour Permissible Exposure Limit (PEL) of 50 $\mu\text{g}/\text{m}^3$, require that the employer implement routine air monitoring, medical surveillance, housekeeping, and training. Employee exposures in excess of the PEL require additional actions by the employer including, routine air monitoring, methods of complying with the PEL, the use of respiratory protection, the use of protective work clothing and equipment, housekeeping practices, hygiene facilities (i.e., change areas, shower and hand washing facilities, and eating facilities), medical surveillance and medical removal protection, employee information and training, warning signs, and record keeping.

Medical surveillance and medical removal protection are based on the blood lead level (BLL) measured in micrograms of lead per deciliter of blood ($\mu\text{g}/\text{dL}$). New MIOSHA rules (effective December 11, 2018) require that employees be removed from lead exposure when their BLL reaches 30 $\mu\text{g}/\text{dL}$ and may not return to work involving lead exposure until their BLL is below 15 $\mu\text{g}/\text{dL}$. Former MIOSHA rules allowed workers to have BLLs of 50 $\mu\text{g}/\text{dL}$ before they had to be removed from lead exposure. Under the former rules, workers could return to work when their BLL was below 40 $\mu\text{g}/\text{dL}$. The average BLL in the general population is 1.12 $\mu\text{g}/\text{dL}$.

How to Avoid Hazards

When employees are exposed above the PEL, the employer must develop a compliance program that includes engineering and work practice controls. The best way to prevent over-exposure to lead is to install and maintain engineering controls to eliminate or reduce the hazard. Examples of engineering and other controls include:

- Conduct bulk material analysis to determine if lead is present.
- Provide interim protection until air monitoring determines exposure levels.
- Use exhaust ventilation and dust collection systems. For example, power tools used for grinding surfaces coated with lead containing paint can be equipped with dust collection systems. Use local exhaust ventilation where feasible.
- Do not dry sweep or use compressed air to clean work areas contaminated with lead materials; use wet methods or a vacuum equipped with a high efficiency particulate air (HEPA) filter.
- Comply with all requirements of Part 603 with regard to air monitoring, compliance program, use of protective work clothing and equipment, housekeeping, hygiene facilities, medical surveillance and medical removal protection, employee information and training, warning signs, and record keeping.
- If engineering and work practice controls cannot be used or do not reduce exposure to an acceptable level, then the employer must provide respiratory protection. The type of respiratory protection required is based on the level of exposure determined by air monitoring. The minimum recommended respirator is a half mask, air-purifying respirator with HEPA filters. Remember, the employer must then implement a respiratory protection program as required by the General Industry and Construction Safety and Health Standard, [Part 451, Respiratory Protection](#).
- If respirators are used to protect employees, then a regulated area should be established to prevent unprotected employees from entering the exposure area.

For additional information regarding the hazards of lead and the measures that can be implemented to protect employees from exposure, you can visit the following web sites at:

[OSHA, Safety and Health Topics, Construction - Lead](#)
[NIOSH, Preventing Lead Poisoning in Construction Workers](#)
[NIOSH, Protecting Workers Exposed to Lead-Based Paint Hazards](#)