Lead



PREAMBLE

Workers are exposed to lead as a result of the production, use, maintenance, recycling, and disposal of lead material and products. Lead exposure occurs in most industry sectors including construction, manufacturing, wholesale trade, transportation, remediation and even recreation.

Construction workers are exposed to lead during the removal, renovation, or demolition of structures painted with lead pigments. Workers may also be exposed during installation, maintenance, or demolition of lead pipes and fittings, lead linings in tanks and radiation protection, leaded glass, work involving soldering, and other work involving lead metal or lead alloys. In general industry, workers come in contact with lead in solder, plumbing fixtures, rechargeable batteries, lead bullets, leaded glass, brass, or bronze objects, and radiators. Lead exposure can occur not only in the production of these kinds of objects but also in their use (e.g., firing ranges), repair (e.g., radiator repair), and recycling (e.g., lead-acid battery recycling).

In the **general population**, lead may be present in small but hazardous concentrations in food, water, and air. Lead poisoning from **deteriorating old paint** is the primary source of elevated blood lead levels in **children. Children** under the age of six are at risk of developing cognitive health effects even at very low blood lead levels. **Pregnant women** or those who might become pregnant must avoid lead exposure because it is toxic to the fetus. Another source of environmental exposure to lead is from workers who take home lead dust on their clothing and shoes.

INCIDENT

A maintenance worker at Republic Steel, an automotive steel manufacturer, suffered severe injuries because the company failed to guard machines and provide lock-out devices, an OSHA investigation found.

The Canton, Ohio-based manufacturer faces $279,578 in proposed penalties after the agency’s investigators found workers at its plant were exposed to machine hazards and lead.

“Companies must continuously monitor their facilities to ensure health and safety procedures are adequate and effective in protecting workers from injuries

and illness on the job," said Dorothy Dougherty, deputy assistant secretary of labor for occupational safety and health in a statement.

On Dec. 5, 2016, a 64-year-old maintenance worker suffered a fractured pelvis after being struck by a sail – a large clamp that holds the steel billet – because lock-out devices were not affixed to the machine's operating parts to stop movement during maintenance, OSHA investigators found.

Days later, OSHA opened a second investigation after a complaint alleged worker were being exposed to lead. Agency investigators documented seven incidents of lead overexposure in the caster facility.

In total, the agency found two repeated and five serious safety and health violations during the two inspections. Among them, the company failed to:

- implement engineering controls to lower exposure to steel dust particulates,
- prohibit employees from eating in areas where lead exposure was possible,
- affix locking devices to machine operating parts during maintenance and
- replace damaged guard and stair rails.

In the past decade, Republic Steel has been cited for more than 250 safety and health violations at its facilities across the country.

BUSINESS / REGULATION

Employers are required to protect workers from inorganic lead exposure under OSHA lead standards covering **general industry (1910.1025), shipyards (1915.1025),** and **construction (1926.62).** The lead standards establish a permissible exposure limit **(PEL)** of 50 µg/m3 of lead over an eight-hour time-weighted-average for all employees covered. The standards also set an action level of 30 µg/m3, at which an employer must begin specific compliance activities, including blood lead testing for exposed workers. The lead standards also include ancillary provisions such as medical surveillance, exposure monitoring, and hygiene facilities and practices that are critical in preventing lead exposure and elevated blood lead levels.

Lead hazards are addressed in specific standards for general industry, shipyard employment and the construction industry. This section highlights OSHA standards and preambles to final rules.

General Industry **(29 CFR 1910)**

- 1910 Subpart I, Personal protective equipment [related topic page]
- 1910.134, Respiratory protection [related topic page]
- 1910 Subpart Z, Toxic and hazardous substances [related topic page]
    - 1020, Access to employee exposure and medical records
    - 1025, Lead
        - Appendix A, Substance data sheet for occupational exposure to lead
        - Appendix B, Employee standard summary
        - Appendix C, Medical surveillance guidelines [related topic page]

Shipyard Employment **(29 CFR 1915)**

- 1915 Subpart Z, Toxic and hazardous substances
    - 1025, Lead. Requirements applicable to shipyard employment under this section are identical to those set forth in 29 CFR 1910.1025.

Jobs associated with lead exposure include painting, building renovation, radiator repair, bridge work, demolition, battery manufacturing, metal production, metal scrap cutting and recycling, plumbing, soldering, and ceramic work, according to OSHA.

STATISTICS

The numbers align with OSHA's estimate that 804,000 workers in general industry and an additional 838,000 workers in construction are potentially exposed to lead. OSHA requires employers to protect their workers under standards covering general industry (1910.1025), shipyards (1915.1025) and construction (1926.62). The standards establish a permissible exposure limit of 50 µg/m3 of lead over an 8-hour, time-weighted average for all employees covered. In addition, OSHA established an action level of 30 µg/m3, which marks the level at which employers must initiate certain compliance actions.

In fact, it is often deadly: Around the world, a worker dies from toxic exposure in their workplace every 30 seconds, according to a 2018 UN report published in September by Baskut Tuncak, the United Nations special rapporteur on toxics. Every 15 seconds, a worker dies from dangerous working conditions in general.

In total, around 2.8 million workers globally die from unsafe or unhealthy work conditions per year, according to the report. And diseases resulting from workplaces—like lung cancer linked to inhaling carcinogenic substances on the job—account for around 86% of all premature death.

"In my view, much of what I describe in the report is criminal conduct," Tuncak said in his address to the Human Rights Council.

Cancer is by far the biggest contributor to those deaths, making up roughly 70% of workplace diseases. "Almost all such cancers can be prevented," the report reads.

"More than 200 different known factors, including toxic chemicals and radiation, have been identified to date as known or probable human carcinogens, and workers are exposed to many of these in the course of their jobs," the UN report reads. "Debilitating and fatal lung diseases, neurological disabilities, and reproductive impairments such as infertility and inability to carry a pregnancy to term are among various other health impacts that plague workers exposed to toxic substances."

Lead poisoning has impacted the safety and health of children in the U.S.

According to Centers for Disease Control and Prevention (CDC), an estimated 250,000 U.S. children have blood lead levels high enough to cause significant damage to their health. Major sources of lead exposure among U.S. children are lead – based paint and lead – contaminated dust found in the deteriorating buildings.

Lead poisoning has its deadly tentacles everywhere in society.

PREVENTION

Workers are primarily exposed to lead by breathing in particles containing lead. Lead compounds can also get on the skin, contaminate clothing or food, and be ingested. The most effective way to prevent exposure to a hazardous material such as lead is through elimination or substitution with viable, less toxic alternatives. The hierarchy of controls describes the order that should be followed when choosing among exposure-control options for a hazardous substance. **Generally, elimination or substitution is the preferred choice (most protective) at the top of the hierarchy, followed by engineering controls, administrative controls, work-practice controls, and, finally, personal protective equipment (PPE)**. Engineering controls include isolating the exposure source or using other engineering methods, such as local exhaust ventilation, to minimize exposure to lead. Administrative controls usually involve logistic or workforce actions such as limiting the amount of time a worker performs work involving potential exposure to lead. When exposure to lead hazards cannot be engineered completely out of normal operations or maintenance work, and when safe work practices and other forms of administrative controls cannot provide sufficient additional protection, a supplementary method of control is the use of protective clothing or equipment. This is collectively called personal protective equipment, or PPE. PPE may also be appropriate for controlling hazards while engineering and work practice controls are being installed. PPE includes wearing the proper respiratory protection and clothing. **Good housekeeping practices** prevent surface contamination. Hygiene facilities and practice protects workers from ingesting and taking home lead are also necessary to prevent exposure to lead.

Other:

Employers also must follow several other requirements from OSHA if their workers are exposed to lead. The requirements are intended to protect workers during their shifts, as well as prevent them from tracking lead home and potentially putting family members at risk. These requirements are:

- Test workplace air for lead and test blood-lead levels in workers.
- Inform workers if their job involves exposure to lead, and provide proper training if that is the case.
- Establish controls for lead dust and fumes in the workplace.
- Provide protective clothing and equipment for workers in exposed areas.
- Give workers a place to wash their hands and shower after a shift.
- Provide workers with a place to change into clean clothes, and ensure work clothes are kept away from street clothes.

Despite the continued presence of lead in the environment, however, lead poisoning is entirely preventable.

To increase awareness of childhood lead poisoning prevention, CDC, EPA and the U.S. Department of Housing and Urban Development, along with local health departments, are participating in NLPPW, with events such as state proclamations, free screenings, lead-awareness community events and educational campaigns conducted nationwide.

Parents can reduce a child’s exposure to lead in many ways. Here are some simple things you can do to help protect your family:

- **Get your home tested.**Before you buy an older home, ask for a lead

inspection.

- **Get your child tested.**Even if your young children seem healthy, ask your doctor to test them for lead.
- **Get the facts!**Your local health department can provide you with helpful information about preventing childhood lead poisoning.