



## Labor and Workforce Development

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### Lead in Construction

#### LEAD IN CONSTRUCTION

Department of Labor Standards  
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#### INTRODUCTION

Lead poisoning has been a serious health concern for centuries. Even though much is known about lead and how it can affect your health, lead poisoning is still very common today.

For many years lead paint has been used on bridges, water tanks, ships and other steel and iron structures, although other coatings are available. Lead-based paint has been banned for residential use since the 1970's; however most houses built before then contain some lead paint. Workers can have very high lead exposure from removing paint from surfaces previously coated with lead paint, such as in bridge repair, residential renovation and deleading, and demolition. In the construction field, lead is also used for roofs, tank linings, and electrical wiring.

#### HOW DOES LEAD AFFECT THE BODY?

Workers can be exposed to lead by breathing in lead dust or fumes from work activities, by eating, drinking or smoking in work areas, or by handling contaminated objects - and accidentally swallowing lead dust. Workers in many workplaces have so much lead in their bodies that they are slowly being poisoned. The symptoms may hardly be noticeable at first. But over time, lead can damage the brain, blood, nerves, kidneys and reproductive organs. This damage can cause serious disability: memory loss, extreme tiredness, emotional problems, even kidney failure, coma or death.

Young children are especially affected by lead. Lead dust can collect on work clothes during the day. When those clothes are worn home, the lead can contaminate workers' cars and homes. Young children can then be poisoned by the lead-contaminated dust.

#### HOW DO I KNOW IF I HAVE TOO MUCH LEAD IN MY BODY?

Lead poisoning can occur when people are exposed to large or small amounts of lead over time. Lead builds up in the body and may cause temporary or permanent damage. A blood lead test can show whether your body has absorbed a dangerous amount of lead. A high blood lead level is an indication that lead is building up in the body faster than it can be eliminated.

#### WHAT ARE THE SIGNS OF LEAD POISONING?

There are many symptoms or signs that suggest a problem with lead, but they can also be symptoms of other illnesses. It is also possible to have lead poisoning without noticing any symptoms. If you work around lead you should regularly see your doctor, whether or not you are experiencing the following symptoms:

#### Early Signs and Symptoms of Lead Poisoning:

- Fatigue
- Headache
- Sleeplessness
- Uneasy stomach
- Irritability or nervousness
- Poor appetite
- Metallic taste
- Reproductive problems

#### Later Signs and Symptoms:

- Aches or pains in stomach
- Memory problems
- Muscle and joint pains
- Constipation
- Nausea
- Weight loss
- Weak wrists or ankles
- Kidney problems

#### HEALTH EFFECTS OF LEAD IN ADULTS

Each individual responds differently to lead exposure. This chart indicates the blood lead levels at which you may experience the various ill effects of lead. In general, the effects of lead on children are even more serious.

Health Effects	Blood Lead Level (mcg/dl)
Severe brain damage (encephalopathy)	100
Headaches, memory and concentration problems, sleep disturbances, mood changes	60 - 70
Anemia	60
Stomach pain, constipation, diarrhea, loss of appetite	50 - 70
Nerve disorders; decreased red blood cells	50
Male reproductive problems; kidney damage	40
Slower reflexes	30
Harmful effects on the fetus; increase in blood pressure	10 - 15

Adapted from ATSDR, Toxicological Profile for Lead (1989)

Extreme cases of lead poisoning can result in convulsions, coma or death.

It is important to emphasize, however, that lead may be causing injury to the body even when none of these signs and symptoms are present. (See Table on health effects of lead.)

### **WHAT IS THE OSHA LEAD STANDARD?**

29 CFR 1926.62 Occupational Safety and Health Administration (OSHA) - covers all construction work in the private sector.

The Lead Standard, written by OSHA, requires employers to do a number of things to make certain the workplace is safe. No employee should be exposed to lead at or above 50 micrograms per cubic meter of air ( $\text{mcg}/\text{m}^3$ ) in an 8-hour day, the OSHA Permissible Exposure Limit (PEL). Clean showers (when feasible), change rooms and lunchrooms must be provided and used. The Standard also requires air sampling for lead exposures, methods for reducing lead in the workplace, a written program showing how the employer will comply with the Standard, medical testing of employees to determine whether their bodies are taking in too much lead, and paid removal from the job in cases of lead poisoning.

The requirements of the Lead Standard are based on airborne levels of lead in the workplace. It should be remembered, however, that swallowing lead dust can also cause a problem. Therefore, keeping the workplace clean is very important.

### **WHAT ARE MY RIGHTS UNDER THE OSHA LEAD STANDARD?**

The Lead Standard gives you, as a worker exposed to lead, several rights provided by your employer. The requirements of the Lead Standard depend on how much lead is in the workplace air.

1. To find out if there is a lead problem your employer must find out how much lead is in the air. To do this your employer must either test the air for lead, or look at air testing results from previous lead construction work having conditions very similar to yours.

2. If you perform any of the tasks in the RESPIRATOR table (see p. 8) and your employer has not shown that your exposure to lead is less than  $30 \text{ mcg}/\text{m}^3$  over an 8-hour day, your employer must do the following:

#### **a. Training**

You have the right to be informed that you are working with lead, as well as any other hazardous materials. Training is required, once a year, in the correct handling of lead products, in the manner in which lead affects your health, in ways to protect yourself from lead exposure and in the details of the OSHA Lead Standard.

#### **b. Air Monitoring**

Monitoring for airborne concentrations of lead is required every 6 months. Your employer must notify you of the results of this monitoring in writing. The permissible exposure limit set by OSHA is  $50 \text{ mcg}/\text{m}^3$ , averaged over an eight-hour work day.

**c. Medical Examinations** (only if you are exposed to lead above  $30 \text{ mcg}/\text{m}^3$  over an 8-hour day, for more than 30 days per year)

You have the right to a medical exam (to be paid by your employer) if you have symptoms of lead poisoning, elevated blood lead levels, difficulty in using a respirator, concerns about the reproductive hazards of lead, or if you are on medical removal protection. (See below).

#### **d. Biological Monitoring**

You have the right to have your blood tested for lead, paid by your employer, to

determine if your body is taking in too much lead, and the results must be given to you in writing. This monitoring is to be repeated at intervals specified in the OSHA Lead Standard.

#### **e. Medical Removal**

You have the right to be removed from lead exposure if your confirmed blood lead level reaches or exceeds 50 micrograms per 100 milliliters of whole blood (mcg/dl). Medical removal continues until two blood lead levels in a row are below 40 mcg/dl. You may also be removed from lead exposure if you have a medical condition that could be worsened by exposure to lead. During your medical removal, your employer must pay you your regular earnings, and keep your seniority and other employment rights and benefits as though your work had not been changed. Medical removal can be continued for 18 months.

In some very extreme cases of lead poisoning a doctor may recommend that you be chelated. Chelation is a medical treatment to remove lead from the blood. There are very serious potential side effects to this treatment, including kidney damage. Therefore, it should only be used in very serious cases and should never be used to routinely keep your blood lead level low.

3. If you perform any of the tasks in the RESPIRATOR table and your employer has not shown that your exposure to lead is less than 50 mcg/m<sup>3</sup> over an 8-hour day, your employer must also do the following:

#### **a. Repeat Air Monitoring Every 3 Months**

#### **b. Showers and Change Rooms**

Your employer must provide clean showers (when feasible), changing rooms and separate storage for street clothes and soiled work clothes.

#### **c. Lunchrooms**

Your employer must provide a lunchroom separate from the work area, and facilities for washing.

#### **d. Ventilation**

Your employer must install local exhaust ventilation or other engineering or work practice measures to limit your exposure so that it does not exceed the PEL, if feasible.

#### **e. Respiratory Protection and Protective Equipment**

Your employer must provide you with appropriate respirators (disposable paper masks are not acceptable) and training in their use, until the PEL can be reached using ventilation or work practice controls, or if such controls are not feasible. You must also be given protective clothing and equipment, including coveralls, gloves, goggles or face shields and shoes.

### **WHAT STEPS CAN I TAKE TO PROTECT MYSELF?**

- Use the ventilation systems that are provided for your protection. Be aware of how these systems work, and whether they are working correctly.
- Use the correct respirator. Your employer must provide the appropriate respirator for the job. Until your employer determines how much lead you are being exposed to, your employer must select a respirator as shown in the RESPIRATOR table on page 8. Your employer must also have a program for cleaning respirators and making sure that they are in good repair and fit properly.

- Keep your work area clean. Do not use compressed air to remove lead dust. Your employer should provide a vacuum with a high efficiency particulate air (HEPA) filter or use a wet cleaning method.
- Do not eat, drink or smoke in work areas. Your employer must provide a separate area free of lead dust.
- Always wash your hands and face before eating, drinking or smoking.
- Shower, wash your hair and change into clean clothes, including shoes, before leaving the workplace. Lead dust on your clothes can contaminate your home and harm your children.
- Store street clothes in a separate locker from your work clothes.
- Eat a well-balanced diet. Fasting can increase your body's lead level. Proper nutrition can help reduce lead levels.

For further assistance or information, please call or write:

Occupational Lead Registry  
 Division of Occupational Safety  
 1001 Watertown Street  
 West Newton, MA 02465  
 (617) 969-7177

To obtain a copy of the OSHA Lead Standard (29 CFR 1926.62) or to file a complaint contact the nearest OSHA area office:

Occupational Safety and Health Administration  
 639 Granite Street, 4th floor  
 Braintree, MA 02184  
 (617) 565-6924

Occupational Safety and Health Administration  
 138 River Road, Suite 102  
 Andover, MA 01810  
 (978) 837-4460

Occupational Safety and Health Administration  
 1145 Main Street  
 Springfield, MA 01103  
 (413) 785-0123

Contents of this brochure were adapted from the Texas Department of Health and the California Department of Health Services.

#### **Which RESPIRATOR do I use for which task?**

TASK	REQUIRED RESPIRATOR*
1. If lead-based paint or other coating is present: <ul style="list-style-type: none"> <li>• manual demolition of structures</li> <li>• manual scrapping</li> </ul>	<ul style="list-style-type: none"> <li>• Half-mask air-purifying respirator with high-efficiency (HEPA) filters</li> </ul> <p style="text-align: center;"><i>or</i></p>

<ul style="list-style-type: none"> <li>• heat gun use</li> <li>• power tool cleaning with vacuum attachment</li> </ul> <p>1. Spray painting with lead</p> <p><b>Expected Airborne Concentration of Lead: 500 mcg/m<sup>3</sup> or less</b></p>	<ul style="list-style-type: none"> <li>• Half-mask supplied-air respirator, operated in demand (negative-pressure) mode</li> </ul>
<p>1. Using lead-containing mortar</p> <p>2. Lead burning</p> <p>3. If lead-based paint or other coating is present:</p> <ul style="list-style-type: none"> <li>• rivet busting</li> <li>• power tool cleaning without vacuum attachment</li> <li>• clean-up where dry expendable abrasives are used</li> <li>• movement and removal of abrasive blasting enclosure</li> </ul> <p><b>Expected Airborne Concentration of Lead: More than 500 mcg/m<sup>3</sup></b></p>	<ul style="list-style-type: none"> <li>• Loose fitting hood or helmet powered air-purifying respirator with HEPA filters</li> </ul> <p style="text-align: center;"><i>or</i></p> <ul style="list-style-type: none"> <li>• Hood or helmet supplied-air respirator, operated in a continuous-flow mode</li> </ul> <p style="text-align: center;"><i>or</i></p> <ul style="list-style-type: none"> <li>• Full facepiece air-purifying respirator with HEPA filters</li> </ul> <p style="text-align: center;"><i>or</i></p> <ul style="list-style-type: none"> <li>• Tight-fitting powered air-purifying respirator with HEPA filters</li> </ul> <p style="text-align: center;"><i>or</i></p> <ul style="list-style-type: none"> <li>• Full facepiece supplied-air respirator, operated in demand mode</li> </ul> <p style="text-align: center;"><i>or</i></p> <ul style="list-style-type: none"> <li>• Half-mask or full facepiece supplied-air respirator, operated in continuous-flow mode</li> </ul> <p style="text-align: center;"><i>or</i></p> <ul style="list-style-type: none"> <li>• Full facepiece self-contained breathing apparatus (SCBA), operated in demand mode</li> </ul>
<p>1. If lead-based paint or other coating present:</p>	<ul style="list-style-type: none"> <li>• Half-mask supplied-air respirator, operated in</li> </ul>

- abrasive blasting
  - welding
  - cutting
- torch burning

**Expected Airborne Concentration of Lead: More than 2,500 mcg/m<sup>3</sup>**

pressure-demand or other positive-pressure mode

*or*

- Full facepiece supplied-air respirator, operated in pressure-demand or other positive-pressure mode

*or*

- Full facepiece SCBA, operated in pressure-demand or other positive-pressure mode

**Note:** 1. If higher lead levels are found than listed in this table, use the appropriated respirator for that lead level.

1. If you requested a powered-air-purifying respirator (PAPR), your employer must provide it as long as it provides adequate protection.

\* Respirators listed for higher concentrations of lead can be used in work environments where there are lower concentrations of lead.

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