LEAD-BASED PAINT ABATEMENT TRAINING FOR WORKERS

Student Manual
Based on EPA Model Curriculum

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Abbreviations

There are many abbreviations used throughout this manual. This reference guide will help you to remember what these abbreviations mean. All of the abbreviations and words on this page are defined in the glossary.

ASV	anodic stripping voltametry
CDC	Centers for Disease Control and Prevention
CFR	Code of Federal Regulations
COSH	Coalition (or Committee) on Occupational Health and Safety
EPA	Environmental Protection Agency
GFCI	ground fault circuit interrupter
HEPA	high efficiency particulate air
HUD	Department of Housing and Urban Development
HVAC	heating, ventilating, and air conditioning system
K-XRF	K-X-ray fluorescence
LBP	lead-based paint
MSDS	material safety data sheet
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PAPR	powered air-purifying respirator
Pb	The chemical symbol for lead
PEL	permissible exposure limit
PF	protection factor
Poly	polyethylene sheet plastic
RCRA	Resource Conservation and Recovery Act
TCLP	toxic characteristic leaching procedure
TSCA	Toxic Substances Control Act
TSP	trisodium phosphate
XRF	X-ray fluorescence
ZPP	zinc protoporphyrin

Units of measure

These units will be explained and defined during this course.

cm	centimeter
cm^2	square centimeter
dL	deciliter
ft	foot
ft^2	square foot
m	meter
m^3	cubic meter
g	gram
mg	milligram
µg	microgram
ppm	parts per million

Key facts for Chapter 1

What is lead?

Lead is a heavy metal.

Lead has been used for thousands of years. It prevents corrosion and kills mold and mildew. It is durable and easy to shape.

Lead is a poison. It can make you sick if you breathe or swallow it.

Lead-based paint is "paint, varnish, shellac, or other coating on surfaces that contain 1.0 mg/cm^2 or more of lead or 0.5 percent or more lead by weight."

Sources of lead exposure

lead-based paint

leaded gasoline

industrial releases

soil, food, and water

pottery, crystal, glassware

some jobs and hobbies

Lead dust

Lead-based paint is a health hazard when it chips or becomes dust or fumes.

Lead dust is created when

- lead-based paint gets old and deteriorates;
- lead-painted surfaces are broken, damaged, or disturbed;
- lead-painted surfaces are sanded or scraped;
- household dust becomes contaminated by other sources of lead (e.g., soil).

Lead dust and particles tend to stick to surfaces.

Lead dust particles can be so small, you can't see them.

Lead-based paint in the home

Lead-based paint in the home is a major cause of childhood lead poisoning.

The United States banned the use of lead-based paint in homes in 1978.

An estimated 38 million American homes still contain lead-based paint.

Key facts for Chapter 2

Lead can poison you and make you very sick.

Even a small amount of lead can make you sick.

Lead is dangerous when you breathe or swallow it.

Lead can cause permanent damage.

Children's developing brains and bodies are easily damaged by lead.

Even low levels of lead can cause permanent damage to a child.

Pregnant women and children are most easily lead poisoned.

Lead in your body

Lead can damage your body without your feeling any symptoms.

Lead poisoning can easily be mistaken for the flu.

Lead attaches to your red blood cells and travels through your body.

Lead can be stored in your body for more than 30 years.

Body burden is the amount of lead stored in your body.

Lead can be released from your bones and poison you.

Lead can harm many parts of your body—blood cells, heart, kidneys, nervous system, bone tissue, and reproductive organs.

Lead can cause men to have **problems having an erection.**

Lead can cause women to have **stillbirths** or **miscarriages.**

Blood tests

Blood tests find out how much lead is in your blood.

The tests used are: blood lead level test and zinc protoporphyrin (ZPP) test. The blood lead level test is the more accurate test.

Blood lead levels are measured in micrograms of lead per deciliter (µg/dL) of blood.

People can have different reactions to the same blood lead level.

Lead poisoning can be prevented.

Your work as a lead abatement worker will prevent future lead poisoning.

You can protect yourself against lead poisoning.

Make sure your employer provides a safe workplace.

Wash your hands and face carefully when you leave the work area.

Use safe work practices that you will learn in this class.

Eat a balanced diet that has enough iron and calcium.

Key facts for Chapter 3

The law is one tool that can be used to secure a safer and healthier job.

The Occupational Safety and Health Administration (OSHA), an agency of the Department of Labor, writes and enforces rules protecting workers on the job.

The Environmental Protection Agency has issued rules protecting lead abatement workers, the public, and the environment.

The Department of Housing and Urban Development (HUD) has established guidelines for lead-based paint abatement projects in housing. They have also issued rules to protect workers and occupants during and after rehab, renovation, and maintenance in federally-assisted housing.

OSHA has set legal limits for airborne lead exposure.

There are two legal limits for the amount of lead you are allowed to breathe: the Action Level, at or above 30 $\mu g/m^3$; the Permissible Exposure Limit, more than 50 $\mu g/m^3$ per cubic meter of air.

Your employer must do an exposure assessment to determine the amount of lead in the air you are breathing.

Your employer must determine how much lead is in the air for each job type.

Certain tasks on construction jobs where lead-based paint is present are known to cause large amounts of lead in the air. These tasks are called "lead-related tasks."

If you will be exposed above the PEL or you will do any of the lead-related tasks in Classes 1, 2, or 3, your employer must provide the following for workers:

- the correct respirator;
- personal protective clothing and equipment;
- an area to change into and out of your work clothes;
- a place for hand and face washing;
- a place where you can shower at the end of the day, if feasible;
- blood tests reviewed by a doctor;
- training on the hazards of working with lead;
- a lead-safe area for eating and drinking;
- warning signs around the work area.

When must I wear a respirator?

According to the OSHA Standard, you are only required to wear a respirator if you are doing a Class 1, 2, or 3 task or if air sampling shows you are exposed above the PEL (50 µg/m^3).

You can request a respirator from your employer, and your employer is required to give you a respirator.

If you are exposed above the PEL, your employer must provide you with a Powered Air Purifying Respirator (PAPR)—if you ask for it and if it provides enough protection for the lead levels to which you are exposed.

The respirator you use will depend on the amount of lead in the air and the job you are doing.

What personal protective equipment do I need other than a respirator?

- coveralls
- gloves
- disposable shoe coverings
- face shield or vented goggles
- hat (adequate head protection based on the hazards present in the work area)

You must clean up floors and other surfaces equipped with a vacuum with a High Efficiency Particulate Air (HEPA) filter.

You must not eat, drink, smoke, chew tobacco, or apply cosmetics in the work area.

Whenever you work with lead, your employer must have a place for you to wash your hands and face.

Your employer must train you on the hazards of lead and how to protect yourself. Employers must provide training to anyone

- working with lead at or above the Action Level (30 µg/m^3);
- doing any of the tasks listed under Class 1, 2, or 3;
- using any lead compounds that cause eye or skin irritation.

Your employer must keep records of

- all exposure assessments done on your job site;
- the types of respiratory protection worn on your job site;
- names and social security numbers of all employees;
- all medical surveillance done on employees;

- all training done for employees;
- all cases of medical removal of employees.

You have a right to see your records.

Special medical exams are required when you work with lead. These exams are called medical surveillance. There are two types: initial medical surveillance and medical surveillance program.

Initial medical surveillance is blood tests that check the amount of lead in your blood.

You need a medical surveillance program if you are or may be exposed to lead on the job at or above the Action Level for more than 30 days in any continuous 12-month period.

Your employer must provide medical surveillance for you at no cost to you, the worker—and at a reasonable time and place.

Medical removal is a way to protect you from becoming lead poisoned.

There are two times that you may be medically removed: if your blood lead level reaches 50 µg/dL or if the doctor has given a written medical opinion to remove you from lead exposure.

Medical removal protection means that your job will be protected if you must be medically removed from your lead abatement job.

Chelation is the medical treatment for severe lead poisoning. Chelating drugs are dangerous to your health.

"Residential Lead-Based Paint Hazard Reduction Act of 1992" is also known as Title X (Title "Ten").

Title X was designed to reduce lead-based paint *hazards* and *lead poisoning*.

Training is required for nationwide for lead workers. Check to see whether EPA or the state/tribe in which you work is running the program.

There are work practice standards which must be followed when doing abatement.

The public is being educated about the dangers of lead-based paint hazards.

EPA has set levels of dangerous levels of lead in dust and bare soil and defined lead-based paint *hazards*.

You must clean up carefully after each job and pass clearance dust-wipe testing.

Your state/Indian tribe may have lead regulations that are more stringent than EPA's.

Key facts for Chapter 4

A lead-based paint hazard is any exposure to lead from contaminated dust, soil, or paint that makes you sick.

Lead dust is a hazard when you breathe or swallow it.

Any painted surface can have lead-based paint.

HUD *Guidelines* recommend testing all painted surfaces.

Test paint or assume it has lead.

Inspections show which paint has lead.

Lead-based paint inspectors must have special training and certification.

Risk assessments look at whether a home contains lead hazards.

Lead risk assessors must have special training and certification.

Lead-based paint dust is a health hazard.

Sources of lead-based paint dust include

- deteriorating lead-based paint
- friction on a lead-based painted surface
- impact on a lead-based painted surface
- places where lead dust builds up

Children and pregnant women are at highest risk for lead poisoning.

Testing for lead in paint and lead hazards

XRFs are used on site.

Paint chip analysis is used on its own and to back up XRF tests.

Paint chip samples must include all paint layers.

Dust wipe tests tell you where there are lead dust hazards.

Dust wipe tests are also done after every abatement job as the final clearance test for the job. The test results show if the post-abatement cleanup was adequate.

Soil tests tell you how much lead is in the soil and if soil-lead hazards exist. Soil may also be tested for lead after lead work is done on the outside of a home or building.

For more information

These publications have more information on the topics covered in this chapter. Your instructor has a copy of the publications marked with a star (*). You can order your own copy by calling 1-800-424-LEAD.

Alliance to End Childhood Lead Poisoning, *Guide to State Lead Screening Laws* (October 1991).

Alliance to End Childhood Lead Poisoning, *Resource Guide for Financing Lead-Based Paint Cleanup* (October 1991).

Environmental Defense Fund, *At a Crossroads: State and Local Lead Poisoning Prevention Programs in Transition.*

* EPA, *Lead: Identification of Dangerous Levels of Lead; Final Rule*; 40 CFR Part 745 (January 2001)

* EPA, *Reducing Lead Hazards When Remodeling Your Home* (September 1997).

* EPA, HUD, and CPSC, *Protect Your Family From Lead in Your Home* (June 2003).

* HUD, *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* (June 1995).

* National Lead Information Center, *Testing Your Home for Lead*, Fact Sheet (1993).

National Lead Information Center Hotline: 1-800-424-LEAD.

Key facts for Chapter 5

Lead-based paint hazards

Lead-based paint-dust exposure is the major cause of childhood lead poisoning.

Lead dust can be found any place where lead-based paint is flaking or damaged.

Lead-based paint can be found in many buildings built before 1978.

Title X (Residential Lead-Based Paint Hazard Reduction Act)

U.S. Congress passed Title X in 1992 to reduce the hazard of lead-based paint.

Title X has a two-step plan for reducing lead hazards: evaluating and controlling lead hazards.

Abatement means controlling the hazard.

Title X states that abatement means "removing lead-based paint hazards permanently."

Anyone doing lead abatement must be trained and certified.

Interim controls reduce lead-based paint hazards temporarily.

Interim controls keep lead dust levels down and may prevent poisoning.

Careful cleaning is important in abatement and interim controls.

A good in-place management program can help prevent lead poisoning.

Monitor any area that you repair to make sure it stays in good condition.

Make sure the interim controls you use are legal in your area.

Anyone using interim controls should be trained and certified.

Community members, building occupants, and workers need to know about lead hazards in the building.

They need to know what is being done to make a building lead-safe.

Special cleaning requires HEPA vacuuming and washing with an all-purpose cleaner or a cleaner made just for lead cleanup.

1. HEPA vacuum all surfaces in the work area.

2. Wash all surfaces with cleaning solution.

3. HEPA vacuum all surfaces again.

Use a HEPA vacuum on lead jobs.

HEPA vacuum all surfaces from top to bottom.

Wear protective clothing and a respirator whenever you use, repair, or clean the HEPA vacuum.

Special cleaning methods must be used when abating lead.

Special cleaning removes lead dust.

Special cleaning is one of the most important jobs in abatement.

Use a cleaner on all surfaces.

Use an all-purpose cleaner or a cleaner made just for lead to wash surfaces. Check what your state and local laws require.

Some cleaners can burn your skin and eyes, so wear gloves and eye protection when you use it and have an eye wash nearby.

Use three containers: (1) cleaner; (2) empty; (3) rinse water.

Use four-step system:

1. Pour or spray the cleaner from a jug or garden sprayer onto the rag or mophead.
2. Wash all the surfaces in a room with lead cleaner. Move from top to bottom, starting from the point farthest from the exit.
3. Squeeze out the dirty rag or mophead into empty bucket.
4. Rinse all surfaces very carefully. Use clean water, rags, and mopheads.

Wash and rinse each room—one at a time.

Check your state and local laws for instructions on how to dispose of the cleanup waste water, rags, mopheads, and debris.

Special cleaning methods can be used as an interim control.

Key facts for Chapter 6

Good setup makes cleaning up at the end of the job easier

When working with lead, you must

keep dust levels down

seal off the work area

repair tears in poly as you work

wear disposable suits and booties while in the work area

wash your hands and face each time you leave the work area

shower at the end of each shift

clean up as you work and at the end of each shift

secure the work site

To set up you will use the following materials

disposable coveralls and booties

poly and duct tape

HEPA vacuum

all-purpose cleaner or a cleaner made just for lead, buckets, rags, and sponges

Before doing the abatement

1. Clean and remove everything that you can from the work area (such as furniture, appliances, etc.)
2. Clean and cover anything that you cannot remove with poly.
3. Remove all carpeting.
4. Cover all floors with poly.
5. If you're only removing paint from one room or one part of a building, then seal off the work area from the rest of the building with poly.

When doing outside abatement, keep lead from getting into the soil

Good setup can prevent lead contamination

During interim controls, setup is important to contain any lead dust that gets created

Key facts for Chapter 7

Always wear a respirator and protective clothing when doing abatement work.

Clean up as you work.

There are four methods to abate lead-based paint:

- Replacement
- Enclosure
- Encapsulation
- Paint removal

Replacement permanently removes the lead-based paint.

Replacement can increase the value of the building.

It can create a lot of dust.

Wet mist before removing the old part.

Clean up as you work.

An enclosure is a dust-tight solid barrier.

A dust-tight enclosure prevents lead dust from leaking out.

Lead-based paint remains.

The surface must be HEPA vacuumed before enclosure.

The enclosure must be strong and durable.

Encapsulation means coating the lead-painted surface with a thick, durable sealing material.

Encapsulation is best used on building parts in good condition.

Whenever you encapsulate, you must prepare the surface first.

Always do a "test patch."

Lead-based paint remains.

Encapsulants may fail.

Make sure the encapsulant you use is legal in your area.

Paint removal methods create a lot of lead dust.

Mist the paint before you scrape or plane it.

Heat guns may create dangerous lead fumes and toxic vapors.

Do not use a heat gun that heats above 1,100° F.

Heat guns can burn you and the building.

Wall papering and painting are not lead-based paint abatement methods.

- **Use only local exhaust tools that have a HEPA vacuum attached to them to remove lead-based paint.**

  Mechanical hand tools create large amounts of dust.

- Only use sanders, saws, needle guns or drills that have a HEPA attachment.
- **Chemical stripping removes paint by means of solvents or caustic paste.**
- **Chemical strippers are dangerous!**

  Chemical stripping may create hazardous waste—on site and off.

  Wear chemical-resistant coveralls, gloves and booties.

  Always wear eye protection.

  Do not use strippers that contain methylene chloride.

  Some strippers can create a fire hazard.

  Make sure you have an ABC fire extinguisher on site.

- **Vacuuming and water blasting should only be used for outside work.**
- **HUD and EPA do not allow these lead-abatement methods for residential work:**

  torch or flame burning;

  machine sanding or grinding (unless equipped with a HEPA filter);

  abrasive blasting or sandblasting (unless equipped with a HEPA filter);

  dry scraping of lead-based paint (with a few exceptions);

  using a heat gun above 1,100 degrees Fahrenheit.

- **HUD does not allow the use of paint strippers in poorly ventilated work spaces.**

Key facts for Chapter 8

Cleanup is the most important part of the abatement job.

Cleanup must be done slowly and thoroughly.

It may take longer than doing the abatement.

Daily cleanup

1. Wrap large debris in poly.
2. Wet mop or wet sweep small debris and bag it.
3. Check the poly and repair any tears or rips.
4. HEPA vacuum all surfaces.

Wait one hour after finishing abatement before you begin final clean up. (Check your state and local laws)

Final cleanup must be done slowly and thoroughly

Final cleanup—Stage 1

Every step of final cleanup is important:

1. Wear protective clothing, including a respirator and goggles.
2. Wet mop the entire area and bag all dust.
3. Take up the first layer of poly.
4. HEPA vacuum all surfaces.
5. Wash all surfaces with a cleaning solution and then rinse. Follow state and local laws about disposal of wash water.
6. HEPA vacuum all surfaces again.
7. Dispose of all cleaning items in sealed 6-mil plastic bags.

Some states require a visual inspection of the abatement job after the first stage of final cleanup. Wait one hour after finishing final cleanup before letting the inspector go in.

Final cleanup—Stage 2

Paint and seal all the abated surfaces.

Final cleanup—Stage 3

HEPA vacuum all surfaces. Wash all surfaces with a cleaning solution and rinse well. HEPA vacuum all surfaces again.

Clearance inspection

Two phases: visual inspection and environmental sampling.

Do this no sooner than one hour after final cleanup is done.

Every lead abatement job must pass a final inspection.

Dust wipe tests measure the amount of lead in the house.

If lead dust levels are too high, you must redo cleanup.

EPA allows states and tribes to treat lead-based paint abatement waste as nonhazardous waste.

Your employer must check with the state or tribe in which the job is being done to determine whether any restrictions apply to the disposal of residential lead-based paint waste.

Waste from a lead abatement job

1. Store waste in a locked place until it can be disposed of.
2. Waste should not be removed from the contained area on the job site until your employer knows if it is hazardous or not.
3. Liquid waste should be filtered before disposal.
4. Hazardous waste can be stored for a limited time (depending on your employer's generator status) at the company's facility.

Handling nonhazardous waste

Wrap or bag solid waste in 6-mil poly.

Label waste "Lead-Contaminated."

Transport solid waste to a lined dump in a covered truck.

Never burn lead waste.

Do not pour liquid waste down a drain, storm sewer, or onto the ground.

Handling hazardous waste

Store hazardous waste in special, labelled containers.

Use a licensed transporter to take the hazardous waste away.

Hazardous waste must go to a licensed disposal site.

A manifest must go with every shipment of hazardous waste.

Key facts for Chapter 9

High levels of lead in soil can be a major health hazard, especially to children.

Children may play in or near lead-contaminated soil and track it back into the home.

Pets can also track it into the home.

Gardens grown in lead-contaminated soil can also be a health risk.

Soil-lead hazard levels are set by EPA or your state or Indian tribe.

A soil-lead hazard* is present in bare soil:

- in a play area when the soil-lead concentration is equal to or greater than 400 parts per million;
- from the rest of the yard (i.e., non-play areas) when the average of samples collected is equal to or greater than 1,200 parts per million.

* Your employer must check with the state or Indian Tribe in which the work is being done to see if they have set different soil-lead hazard levels.

Lead-contaminated soil in residential areas can be treated in two main ways:

Abatement—either removal and replacement or covering the soil with concrete or asphalt.

- Replacement soil must have lead levels close to the local background levels, but not more than 400 ppm.
- Make sure all underground utilities have been marked *before* you dig!

Interim controls—laying sod, planting grass, and mulching.

Exterior dust cleanup is usually done after soil abatement because soil abatement typically causes surrounding concrete areas to become contaminated.

Key facts

- **A respirator will not protect you unless it fits**.
  You must have a fit test before you can wear a negative-pressure respirator at work.

- **Fit testing**.
  You must have a fit test at least every year.
  There are two types of fit tests:
  1. Qualitative fit-testing. This test doesn't use machines. It uses your sense of smell.
  2. Quantitative fit-testing. This test uses a machine that measures how much air leaks around the edges of you respirator

- **Before you put on your respirator**
  Inspect your respirator before you put it on.
  Do your own fit checks every time you wear your respirator.
  There are two types of fit tests:
  1. Negative pressure fit check. Cover the filters and breathe in.
  2. Positive pressure fit check. Cover the exhaust valve on your chin and blow out.

- **Clean your respirator**.
  Clean your respirator every time you wear it. Use soap and water.
  Store your respirator in a clean, safe place

- **Filter cartridges**
  Change the filters when it gets hard to breath.
  Use the right filter for the hazard - HEPA filters for lead. If you use solvents or caustic paste, you will need other filters as well as HEPA filters

Key facts

- **Wear personal protective clothing and equipment**.
  Anyone working with lead should wear disposable coveralls, gloves, and booties.
  If you are working with chemical strippers, your protective clothing should be chemical-resistant.
  Wear goggles while working with lead.

- **According to the OSHA Lead Standard, your employer must have your non-disposable clothing washed for you**.

- **Your employer must replace your disposable work clothes**
  Disposable work clothes must be replaced when they rip beyond repair.

- **Follow good hygiene practices**.
  Store your street clothes in a clean place.
  Wash your hands and face whenever you leave the work area, especially before you eat or smoke.
  Remove your protective clothing and shower at the end of the day.
  Put your street clothes on. Do not bring your work clothes home

- **Don't take lead home**
  Always leave your work clothes on the job. Never wear any work clothes home

Key facts for Appendix A

The four abatement methods used in a home are

- replacement
- enclosure
- encapsulation
- paint removal

Replacing lead-painted windows, doors and woodwork is a good way to reduce lead hazards.

Back-caulk **and** nail (or screw in) replacement parts when you install them.

Do not use encapsulants on structurally damaged walls or walls that are separating from the substrate.

Enclosure is often used for lead-painted floors and ceilings.

Create a dust-tight seal when you enclose a surface.

Back-caulk **and** nail (or screw in) enclosure materials.

When working on outside structures, setup is very important.

Interim controls are only temporary solutions.

They are actions you can take to reduce lead dust levels until you do an abatement.

Interim controls should not take the place of abatement.

Interim controls may not be allowed in your state or local area. Check your state and local laws.