



AWARENESS

EDUCATION

SAFETY



A Guide To Lead-Safe Living

March 2004

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RESOURCE MATERIALS

US Department of Energy Lead-Safe Weatherization Training and Reference Manual for Weatherization Managers and Crews, 2002 Edition.

HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, October 1997 Revision.

HUD Lead Paint Safety: A Field Guide for Painting, Home Maintenance, and Renovation Work, March 2001.

Lead Abatement Training for Supervisors and Contractors, Volume 1 & 2, EPA Model Training Curriculum, 1996-1997 Revision.

EPA Model Worker Course: Residential Lead-Based Paint Abatement Student Manual, June 1998 Edition.

EPA Lead-Based Paint Risk Assessment Model Curriculum Student Manual, June 1995 Edition.

National Environmental Training Association Lead-Based Paint Maintenance Training Program: Work Smart, Work Wet, and Work Clean To Work Lead Safe, 1997 Edition.

EPA/HUD/CPSC Protect Your Family From Lead In Your Home, September 2001.

In Memory of
John Vega

Master Inspector Unselfish Mentor



Foreword

The fact that you are reading this booklet shows your concern for your children's health. There are many groups of professionals that wish to help you in this effort. The Oregon State Department of Human Services and The Western Regional Lead Training Center at Oregon State University are pleased to present this information.

The first step in controlling the hazard is understanding the facts. Lead poisoning in children is the number one, *preventable*, childhood disease today. Lead and lead-based paint cannot be entirely removed from our environment but the hazards can be managed.

Most adults have the basic understanding that lead is poisonous to humans. This guidebook is meant to take you beyond the basic "*lead-based paint is bad*" awareness. Once you have a good working knowledge of the hazards of lead, you can manage the problem successfully.

Patrick J. Lehne
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Myths About Lead-Based Paint

The myths about lead-based paint include:

- ◆ Lead-based paint (LBP) was taken care of years ago—it is not a problem now.
- ◆ My child does not eat paint chips, so I don't have to worry.
- ◆ Lead-based paint is only in very old homes.
- ◆ My child does not chew on window sills, so I don't have to worry.
- ◆ Lead-based paint is only in the eastern United States.
- ◆ I could tell if my child were poisoned by lead-based paint.
- ◆ I just painted my house, so I don't have a lead-based paint problem.
- ◆ Our doctor regularly checks my child for elevated blood-lead levels.
- ◆ I can safely remove lead-based paint by scraping or sanding it off.
- ◆ I'm having my house remodeled, and the contractor will always do it safely.
- ◆ Lead-based paint is only in the ghettos and slums of older and bigger cities.
- ◆ Lead-based paint looks different than non-lead-based paint.

THESE MYTHS ARE ALL DEAD WRONG!

The History of Lead

In Paint

About 3,000 B.C. man began adding lead to paint. Think about that for a moment. The lead that was added to paint 5 centuries ago is still around and the color is still easy to see.

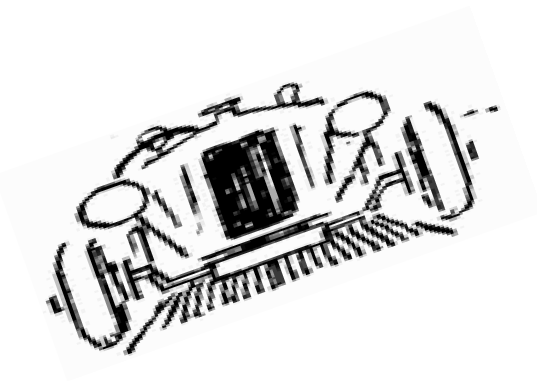
Lead is a basic element of nature. It will be in our environment forever. The problem is, man found that lead-based paint lasted much, much longer than paint without lead.

So he dug it out of the earth, where it was safe, and began adding it to paint. He found many other uses for it but our main concern today is lead paint and the dust it generates. The peak use of lead in household paints was about the mid-1930's in the U.S.

The idea that lead-based paint is harmful to humans is not new either. France discouraged its use in 1840. Germany banned lead in household paint in 1870; Australia in 1904; and the U.S. instituted its ban in 1978.

One estimate is that more than 3 million tons of lead-based paint remain in the 57 million homes built prior to 1980 in the U.S. This lead is still as toxic to humans as the day it was mined.

Lead Makes Great Paint !



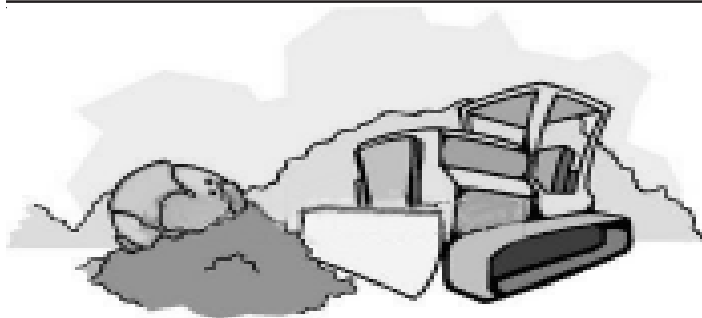
In Gasoline

In the 1920's, General Motors, Standard Oil, and Dupont Corp. began adding lead to gasoline. They hoped it would reduce engine noise and increase performance. And it did.

Cars burned the fuel, but because lead is a chemical element, it was not destroyed. It was just exhausted into the atmosphere and settled in the soil along the roadways.

The lead that was added to gasoline, then deposited into the soil is still there. It can be tracked into homes as lead dust.

Sources



Lead is very useful. So we mine and use it in many different ways. If you are involved in any of the activities listed below you should take care not to bring home lead or lead dust.

Occupational

Plumbers, pipe fitters
 Lead miners, smelters, & refiners
 Auto body repairers
 Radiator repairers
 Glass manufacturers
 Shipbuilders
 Printers (ink)
 Plastic & rubber manufacturers
 Police officers
 Firing range instructors
 Steel welders or cutters
 Construction workers
 Gas station attendants
 Battery manufacturers
 Bridge reconstruction workers
 Remodelers and roofers
 Painters

Hobbies and Related Activities

Glazing pottery
 Target shooting at firing ranges
 Reloading gun shells
 Lead soldering
 Oil Painting (Artistic) Pastel art pencils
 Preparing lead shot and fishing weights/sinkers
 Stained glass
 Car or boat repair
 Home remodeling
 Furniture refinishing
 Old painted wooden/metal toys
 Candlewicks (10% of metal wicks)

Environmental

Lead-containing paint
 Soil/dust near lead industries, roadways, lead-painted houses
 Plumbing leachate
 Imported ceramic tiles in kitchens and bathrooms
 Ceramicware/glazed pottery
 Porcelain bathtubs and sinks
 Leaded glass/pewter
 Leaded gasoline
 Soldered seams on canned food
 Soldered copper pipes
 Brass plumbing fixtures
 Bronze, pewter, leaded crystal
 Electronics manufacturers
 Pesticides
 Miniblinds
 Wine bottles (lead foil banned 1996)
 Crayons
 Storage batteries
 Mineral wool
 Pb-telluride semiconductors
 Building materials:
 Nails, gutters, flashing, tile, window glazing
 Plastic insulation on wiring, old telephone wiring
 Solar panels and solar calculators
 Auto tire balance weights
 Curtain weights
Substance Use
 Folk remedies
 Cosmetics/some hair dye
 Moonshine whiskey
 Gasoline "huffing"

Health Effects

Lead is a naturally occurring metal found in the earth's crust. Lead has been mined, processed, and used in commercial and household products for thousands of years. In the past lead was used in paint, gasoline, pottery, water pipes and other products. When lead gets into the body it is a poison and harms people. It is not part of our normal food chain but it chemically resembles the element calcium. Calcium is a basic building block of bones and teeth so our bodies are "tricked" into using lead just like calcium. A growing child's body needs more of these basic building blocks than adults so a child will keep a larger percentage of lead in its body.

There is another major difference between adults and children. From birth to age 6, a child's brain is rapidly developing. It is learning how to learn. Its fundamental IQ is being set. Many professionals believe that by age 6, our IQ levels are as high as they will ever be. A child, whose brain and nervous system are burdened with lead during development, will not grow to his or her full potential.

A piece of lead as small as a grain of sand is enough to poison a child.
It is the Number One Preventable Childhood Disease in the Country.
Centers for Disease Control and Prevention 1991

Children and adults can get lead poisoning by breathing or swallowing dust that contains lead. Children are more likely to be exposed when they put their hands or other items like toys in their mouths. Once lead enters the human body, there is no way to destroy it or make it harmless. Therefore, we must control exposure to lead. Even small amounts can be harmful.

Let's review. [This Problem Is Permanent But It's Preventable!](#) As parents you are the first line, and in most cases, the only line of defense of this national health problem.



It is important to know that even exposure to low levels of lead can permanently affect children and make them slow learners. In low levels, lead can cause:

- Brain damage and lower intelligence
- Behavior and learning problems
- Hyperactivity
- Impaired speech and language
- Slowed growth
- Kidney and liver damage
- Hearing damage

Health Effects

The only way to know if you have lead poisoning is to get a blood test from your doctor. Many people mistake the symptoms of lead poisoning for other common illnesses, such as a cold or the flu. Sometimes there are no symptoms at all. Lead poisoning is not easy to detect. Some early signs and symptoms of lead poisoning in children are:

- Persistent tiredness
- Irritability or Crankiness
- Weight loss.
- Hyperactivity
- Poor appetite
- Reduced attention span.
- Trouble sleeping
- Constipation
- Aches or pains in stomach.



IS YOUR CHILD AT RISK FOR LEAD POISONING?

1. Does your child live in or regularly visit a home, child care or other building built before 1950?
2. During the past 6 months has your child lived in or regularly visited a home, child care or other building built before 1980 with recent or ongoing painting, repair, remodeling or damage?
3. Does your child have a brother, sister, other relative, housemate or playmate with lead poisoning?
4. Does your child spend time with an adult that has a job or hobby where they may work with lead (such as painting, remodeling, auto radiators, batteries, auto repair, soldering, making sinkers, bullets, stained glass, pottery, going to shooting ranges, hunting or fishing)?
5. Do you have pottery or ceramics made in other countries or lead crystal or pewter that are used for cooking, storing or serving food or drink?
6. Has your child ever used any traditional, imported or home remedies or cosmetics such as Azarcon, Alarcon, Greta, Rueda, Pay-loo-ah, or Kohl?
7. Has your child been adopted from, lived in or visited a foreign country in the last 6 months?
8. Do you have concerns about your child's development?

If you answered yes to any of these questions, ask your health care provider for a blood lead test.

Exposure to high levels of lead can be devastating to children, including seizures, unconsciousness, and, in some cases, death. Lead exposure, lead can be dangerous for adults too.

In adults, high lead levels can cause:

- | | |
|--|---|
| Increased chance of illness during pregnancy | Stillbirth |
| Harm to a fetus, including brain damage or death | Miscarriage |
| Fertility problems (in men and women) | Low birth rate |
| High blood pressure | Premature birth |
| Digestive problems | Impairment of sensory-motor development |
| Nerve disorders | Muscle and joint pain |
| Memory and concentration problems | |

Understanding Your Child's Lead Test



The amount of lead found in a child's blood is called a blood lead level. Blood lead tests tell how many micrograms (millionth of a gram) of lead are in each deciliter (tenth of a liter) of a child's blood ($\mu\text{g}/\text{dl}$). A blood lead level will tell if a child has been exposed to lead in the last 3-4 months.

The only way to be sure of your child's blood lead level is to have it tested.

To find out how much lead is in a child's blood, a small amount of blood is taken from a child's arm, finger or heel. Taking blood from a child's finger or heel is called a finger or heel-stick or a capillary test. Sometimes the blood from a capillary test may be contaminated by a small amount of lead on the child's hand or foot. This may cause an inaccurate or false elevated test result. Blood taken from an arm vein (venous blood test) is a more reliable test.

5-9 $\mu\text{g}/\text{dl}$

If the blood was taken from your child's finger or heel it may be in this range due to contamination. If the test was a venous draw it MAY be a sign of recent exposure to lead. At this level no medical management is needed, but parents should take steps to identify possible sources of lead in their child's environment in order to prevent any further exposure. There is no totally safe level of lead for children. Recent research has shown that lead levels below 10 $\mu\text{g}/\text{dl}$ can lower intelligence. You should keep your child away from lead around the home and give your child healthy foods. Serve foods high in calcium, iron, and vitamin C and low in fat. Lead absorption is increased when there is not enough iron or calcium in a child's diet.

10-14 $\mu\text{g}/\text{dl}$

Any level above ten is considered elevated. If a capillary test is above ten, a venous blood lead test (from an arm vein) will need to be taken within 3 months to confirm the blood lead level. Children can be hurt by lead and may not look or act sick. If the lead level doesn't drop down, children can experience permanent health problems. Identify and remove possible lead hazards and feed your child a diet that will help protect them from lead. Serve foods high in calcium, iron, and vitamin C and low in fat. Lead absorption is increased when there is not enough iron or calcium in a child's diet. Your child will need another blood test in 3 months to see if the level of lead has lowered.

Understanding Your Child's Lead Test

15-19 $\mu\text{g}/\text{dl}$

A level of 15-19 $\mu\text{g}/\text{dl}$ means there is a greater risk for problems with growth and learning. Children can be hurt by lead and may not look or act sick. If a capillary test is at this level, a venous blood lead test (from an arm vein) will need to be taken within 1 month to confirm the blood lead level. Sources of lead can be found in the home, school, yard or places a child frequently visits. It is important to identify and remove lead hazards. The local health department will contact you and schedule a home visit to help you identify lead hazards. Serve foods high in calcium, iron, and vitamin C and low in fat. Lead absorption is increased when there is not enough iron or calcium in a child's diet. The child will need another blood test in 3 months to see if the level of lead has lowered.

20-44 $\mu\text{g}/\text{dl}$

If a capillary test is at this level, a venous blood lead test (from an arm vein) will need to be taken within 1 week to a month to confirm the blood lead level. The higher the blood lead level on the screening or capillary test, the more urgent the need for a confirmation test. A child with a confirmed venous draw in this range has a high lead level and needs to be seen by a doctor or health care provider for a medical exam. Sources of lead can be found in the home, school, yard or places a child frequently visits. It is important to identify and remove lead hazards. The county health department will contact you and schedule a home visit to identify lead hazards. Lead hazards must be found and reduced as quickly as possible. Serve foods high in calcium, iron, and vitamin C and low in fat. Lead absorption is increased when there is not enough iron or calcium in a child's diet. The child's medical provider should be involved in helping bring this blood lead level down by managing the child's diet and providing vitamin supplements if needed. Your child will need another blood test in 1 month to see if the level of lead has lowered.

Above 45 $\mu\text{g}/\text{dl}$

If a capillary test is at this level, a venous blood lead test (from an arm vein) will need to be taken immediately or within 48 hours to confirm the blood lead level. The higher the blood lead level on the screening or capillary test, the more urgent the need for a confirmation test. A child with a confirmed venous draw in this range has a dangerous lead level and may need medical treatment. Very high levels of lead can damage the brain and kidneys. Lead hazards in the child's environment must be found and eliminated. The child's medical provider should be involved in helping bring this blood lead level down by managing the child's diet and providing vitamin supplements if needed. Your child will need regular medical follow-up and re-testing to see if the level of lead has lowered.



Ten Simple Steps:

Lead dust and soil is the real danger.

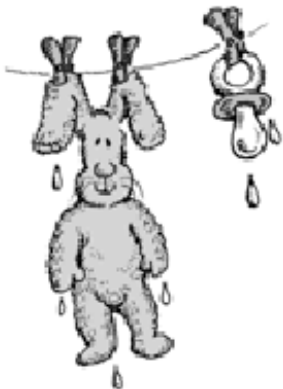


Teach children to wash their hands before they eat or sleep. There are many reasons for children to wash often. Lead poisoning is one of the best.

Encourage your children to play in grassy areas instead of dirt. Bare soil areas are especially dangerous to toddlers as they have numerous hand-to-mouth activities. Dirt on toys and fingers is then ingested by the children and adds to their total lead burden.



Keep your home clean. At least once a week, wash areas such as hard surface floors, baseboards, and window sills, especially if your home was built before 1978. This is easier said than done but at least clean the rooms that children use and play in. Use a solution of water and an all-purpose cleaner.



Wash toys, bottles, and pacifiers often, and always wash them after they fall on the floor. Stuffed toys in particular accumulate dust and should be washed often. Newborns and infants should play on blankets that are washed often. Carpets can hold huge amounts of lead dust and these small people will have their faces very close to it when playing.

Make sure your children do not have access to peeling paint and do not chew on painted surfaces such as cribs, playpens, or window ledges. Even if you live in a newer home there can be trace amounts of lead in the paint. These small amounts can add up in your child's blood stream.

To Protect Your Children

Good food can lessen the effects of lead exposure.



Make sure your children eat at least three meals a day. The body is constantly looking for the nutrients in food to process. Less lead is absorbed when children have food in their systems.



Give your children foods high in iron and calcium, such as milk, cheese, fish, peanut butter, and raisins. When a child does not have enough iron or calcium in his or her body, the body mistakes lead for these nutrients. A diet lacking protein, vitamin C, and zinc may also cause increased blood-lead levels.

Avoid giving your children fried and fatty foods. These foods allow the body to absorb lead faster. Cut down on fat by baking, broiling, or steaming food.



Don't store food or liquid in lead crystal glassware or imported or old pottery. Ceramics can contain high lead levels. If they are not fired or glazed properly, the lead is "leachable" and will be drawn into the food. If you want to be sure your dishware is safe you can test them with a *Lead Check*[™] tube.

Teach your children about the dangers of lead and their role in keeping themselves safe. Use stories, role-playing, and songs to help your children recognize sources of lead and learn prevention behaviors. Explain how good nutrition prevents lead poisoning, and help them choose healthy foods.



Understanding The Numbers

As you read this and other documents about lead-based paint you will encounter numbers and terms that are not normally part of your daily life. Let's take some of the mystery out of them.


A packet of sugar you would find in a restaurant is about 1 "gram" (1.0 g) of material.



Within that gram are 1,000 "milligrams" written simply as (mg).
 Each milligram contains 1,000 "micrograms" and is written as (ug).

So, each sugar packet has 1.0 g or 1,000 mg or 1,000,000 ug.
 (1 X 1,000 X 1,000 = 1,000,000)

The lead content in paint is reported in milligrams per square centimeter or (mg/cm²).

A centimeter is about 3/8 of an inch so a square centimeter is  this big.

Paint

1.0 milligram of lead per square centimeter is defined as "Lead-Based Paint."

It is written as **1.0 mg/cm²**

Another way to report lead in paint is in "Parts Per Million" or PPM. But paint sampled this way may not show the true lead hazard. The concentration of lead can be "diluted" or proportionally reduced as more recent layers of non-lead paint are added to the older layers of lead paint.

Dust

As we will see later, most of a child's normal exposure is from indoor dust that contains too much lead. Lead-dust is reported in "micrograms per square foot" or (ug/ft²). The allowable lead-dust levels are:

Floors	40 ug/ft ²
Interior Window Sills	250 ug/ft ²
Exterior Window Sills (also called window wells or troughs)	400 ug/ft ²



Dust with lead above these levels, especially the floors, can be very dangerous to children.

Soil

Soil tested for lead is reported in PPM. The level for exposed dirt in play areas and high traffic areas should be as low as possible but certainly below 400 PPM.

Water

Drinking water tested for lead is reported in Parts Per BILLION (PPB); not to exceed 15 PPB.

Testing Methods



Paint is normally tested with a device called an X-ray Fluorescent Spectrum Analyzer (XRF). The instrument is placed against a painted surface and, in a very short time, will report the lead content in all the layers of paint. It causes no damage to the paint or the surface.

A paint chip can also be taken and sent to a laboratory for testing. A paint chip should be taken over a precisely known area and all the layers need to be included in the sample. This method will cause damage to the surface being tested or sampled. Whenever possible paint should be reported in mg/cm² not PPM.

There are home test kits for paint. They use a special chemical that, when applied to lead paint, will change color. These “spot” or “chemical” tests can be done on paint but they will not tell you how much lead is present. There are other conditions that will give you false readings, so these kits are not 100% accurate. These same chemicals can be used to test dishes, glassware and pottery.



See the “Lead Professionals” page for more information about lead inspections.

Dust wipe tests are done as part of a Risk Assessment or for a Clearance Test. The wipe is usually over a one-square-foot area and the results are reported in micrograms per square foot (ug/ft²). Dust wipe tests are the best indicators of conditions hazardous to children.



Soil testing is very simple. Once the area to be tested is selected, 5 to 10 spoonfuls (sub-samples) of the topsoil are taken and placed in a zip-lock bag. The samples should not be deeper than 1/4 inch and taken in a 1- to 2-square foot area for play areas. If the drip line of a house is sampled the sub-samples should be about 6” apart. Rocks and twigs should not be included.

Water should be sampled from the cold water kitchen tap. This is the water used for cooking and drinking. Before sampling, the water must sit undisturbed in all the household plumbing for 6 hours. Contact your local water district for the proper sample containers and which labs to send them to.



Laws and Regulations

The State of Oregon has an EPA-authorized lead-paint program. Oregon requires lead professionals to be trained, certified and licensed. These include:



Inspectors testing for lead in paint, soil, dust and water.

Risk Assessors analyzing homes for lead hazards and offering advise on hazard controls.

Supervisors overseeing lead abatement projects.

Workers doing lead abatement.

Project Designers writing abatement specifications on large, commercial projects.

This training and certification is also required by the EPA if these professionals are working in states which do not have an EPA-authorized state lead program.

Pre-Renovation Education Rule

Anyone who is compensated for work that disturbs paint in pre-1978 housing must:

- **Distribute** the *Protecting Your Family From Lead In Your Home* pamphlet to the homeowner or the tenants before renovation starts.
- **Obtain a Confirmation of Receipt of Lead Pamphlet** or a *Certificate of Mailing* before work starts.
- **Distribute Renovation Notices** to tenants of multi-family housing when doing work in common areas.
- **Retain** the records for 3 years and 6 months.

New Lead-Based Paint Regulations

Oregon Administrative Rule (OAR) 333-069 requires that any person removing or stabilizing paint on housing or child-occupied care settings built before 1978 must obtain a Permit from the Department of Human Services.

Warning Signs

When disturbing or removing more than 1 square foot of paint on pre-1978 housing or child-occupied facilities, painters must post a sign, visible from 30 feet, warning the public of POSSIBLE LEAD-BASED PAINT HAZARDS.

Lead-Based Paint Permits

Anyone disturbing or removing more than 1 square foot of paint on pre-1978 target housing must get a Lead-Based Paint Permit from DHS. The permit fee is \$5. Permits expire on June 30. "Lead Paint Safety: A Field Guide for Painting and Renovation Work" is available from the Housing and Urban Development (HUD) website at www.hud.gov/lead.



Heat Guns

In the State of Oregon it is unlawful to use a heat gun for stripping paint if the operating temperature exceeds 750⁰ Fahrenheit.



Check Lists

Use the following lists to insure safety before, during and after the job

Setup check list

- | | |
|--|--|
| <input type="checkbox"/> Put up warning signs | <input type="checkbox"/> Personal hygiene facilities in place |
| <input type="checkbox"/> Identify work site safety hazards | <input type="checkbox"/> Assemble equipment and tools |
| <input type="checkbox"/> Clean and remove items you can | <input type="checkbox"/> Check personal protection equipment |
| <input type="checkbox"/> Seal off HVAC outlets | <input type="checkbox"/> Seal off the work site |
| <input type="checkbox"/> Do necessary repair work | <input type="checkbox"/> Separate the work and non-work areas |
| <input type="checkbox"/> Set up decontamination area | <input type="checkbox"/> Set up locked storage for waste |
| <input type="checkbox"/> Cover and seal items left in the work area | <input type="checkbox"/> Secure the work site |
| <input type="checkbox"/> Install containment | <input type="checkbox"/> Final briefing for all personnel |
| <input type="checkbox"/> Provide owner/tenant with "Protect Your Family" (EPA) booklet | <input type="checkbox"/> Have them sign necessary document/release |

Daily check list

- | | |
|---|---|
| <input type="checkbox"/> Critical barriers secure | <input type="checkbox"/> PPE updated as needed |
| <input type="checkbox"/> Containment secure | <input type="checkbox"/> Waste storage secure |
| <input type="checkbox"/> Review of lead-safe work practices | <input type="checkbox"/> Daily clean up completed |



Completion check list






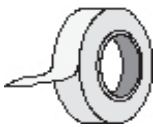









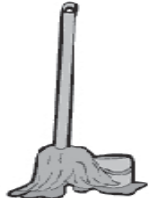


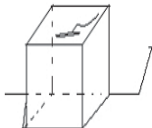



- | | | | |
|---|--------|-------|--------|
| Was work properly completed as requested..... | Yes___ | No___ | N/A___ |
| Contaminated debris properly bagged, sealed and labeled..... | Yes___ | No___ | N/A___ |
| Contaminated debris, tools, materials and equipment removed from residence..... | Yes___ | No___ | N/A___ |
| Resident's belonging returned to original place..... | Yes___ | No___ | N/A___ |
| Resident notified of job completion..... | Yes___ | No___ | N/A___ |
| Final cleaning completed..... | Yes___ | No___ | N/A___ |
| Other lead problems noted..... | Yes___ | No___ | N/A___ |
| If "Yes", other lead problems reported..... | Yes___ | No___ | N/A___ |
| Clearance testing required..... | Yes___ | No___ | N/A___ |
| If "Yes", clearance tests passed..... | Yes___ | No___ | N/A___ |

Tools and Materials

Depending on the task, some or all of these basic items will be needed to work lead-safe.

High risk tasks will require items noted with a  symbol.

	 6 mil poly tarp material or equivalent		Various scrapers and sharpening file.
	Staple gun and short staples. 1/2" or less		Disposable towels, towelettes and rags
	2" wide painters tape and duct tape.		 HEPA type vacuum NOT a simple shop vac !
	Utility knife and supply of sharp blades		Broom (wet sweep only)
	Tack pads		Dust pan
	6 mil poly bags or double bag waste		All-purpose cleaner or lead-specific cleaner
WARNING LEAD HAZARD	 Signs and/or caution tape		 Mop with clean heads and 2 buckets (1 with wringer)
	Spray bottle or pressure type tank with spray head		 Mini containment and or decontamination chamber

Personal Protection Equipment

For high risk or high dust jobs, or if chemical strippers are used, some or all of these items are recommended.



Respirators should always be worn when creating lead-dust. These should have HEPA (purple) type filters and allow for proper fit testing. If chemical stripping is to be done, consult the “Material Safety Data Sheet” (MSDS) for the product being used. This will insure the proper filter type and protect against fumes.

Proper eye protection is essential on any construction site. Use a type that will provide good side protection. If chemicals are being used, consult the MSDS for proper type and the possible need for an on-site eye wash station.



Cotton or leather work gloves are recommended when performing any construction activities but they are not required for lead work. If you are using chemical strippers, cotton work gloves are NOT recommended. They can hold chemicals against the skin and increase the danger of skin burns.

When strippers are being used, consult the MSDS forms to determine the proper type of gloves.



To keep your clothes free of lead-dust use coveralls over your street or work clothes. These can be the disposable type or re-useable. If re-useable coveralls are being used, they should be left on the job site and washed separately from other family clothes.

As with hand, eye and lung protection, the proper clothing is important when using chemicals. The MSDS sheets will provide this information.



Abatement

Abatement is the permanent elimination of lead-based paint hazards. Merely painting or papering over lead-painted surfaces is not abatement. The five methods below are for abatement of structural components in housing. Abatement must be completed by a certified abatement contractor.



Replacement

Building Component Replacement is the removal of components coated with LBP and replacement with lead-free components.

Advantages

- + permanent solution
- + usually minimizes dust generation
- + minimizes exposure
- + allows for upgrading
- + can be combined with other renovation
- + safest permanent intervention

Disadvantages

- expensive
- areas next to replaced part may be damaged
- may not be permitted
- generates large amounts of waste
- can generate large amounts of dust

On-Site Paint Removal



Paint removal is the stripping of lead-based paint. Choose paint removal only if no other strategy will work or if an object has historical value.

Advantages

- + permanent solution
- + less costly than replacement or enclosure

Disadvantages

- significant lead dust generation
- hazardous waste generation
- caustic materials
- special equipment



Abatement

Off-Site Paint Removal

Off-Site Paint Removal is a combination of replacement and on-site removal. The component is removed from the building and re-installed after the paint has been dipped and stripped at an off-site facility.



Advantages

- + permanent solution
- + minimal waste
- + good for historic preservation
- + no hazardous chemicals in the home

Disadvantages

- expensive
- may create some lead dust
- glue joints may deteriorate

Enclosure

Enclosure is the mechanical attachment of a rigid barrier to a building component and where all the seams are sealed. Standard sheetrock is a good example of enclosure. “Warning Lead Hazard” signs should be attached to the component before the enclosure material is applied.



Advantages

- + can use standard construction materials
- + minimal waste generation
- + minimal dust generation

Disadvantages

- not a permanent solution
- cannot be used on unsound structures
- vulnerable to water and physical damage
- must be monitored
- can be expensive

Encapsulation

Encapsulation is a special coating applied like paint. When dry, it forms a barrier that may be considered permanent.



Advantages

- + lead dust is not generated
- + wide range of products

Disadvantages

- not appropriate for all surfaces
- may be subject to water damage

Interim Controls

Interim controls are actions you can take to reduce lead hazards in your home without hiring an abatement contractor. They are less expensive than abatement and a good alternative, but it is very important to remember that the results are only temporary. Nevertheless, if maintained properly, interim controls can protect you and your family for a long time.

Advantages

- + Less expensive than full abatement
- + Can be done immediately

Disadvantages

- Lead-based paint still remains in the housing
- Requires ongoing monitoring

Common Interim Controls

Paint film stabilization is repairing deteriorated paint and applying a fresh coat of lead-free paint.

Advantages

- + Low cost
- + Can be done by unskilled labor

Disadvantages

- Not appropriate when surface is damaged
- Not appropriate in high wear areas
- Repairs can create lead-dust

Friction or impact surfaces can be covered with abrasion-resistant material.

Advantages

- + Low cost
- + Effective control of future dust generation

Disadvantages

- May create lead dust
- Some construction required



Advantages

- + Does not require special equipment (except for HEPA vacuum)
- + Quick and effective
- + Directly reduces occupant exposure

Dust removal should always be done after any abatement, interim control or general remodeling.

Disadvantages

- Only effective if surfaces are cleanable
- A temporary fix only, if source is not controlled

Soil with moderate amounts of lead can be covered with sod, mulch, or gravel. Or the playgrounds can be moved to a new location.

Advantages

- + Reasonably low cost
- + Does not require special equipment
- + Can be done with unskilled labor

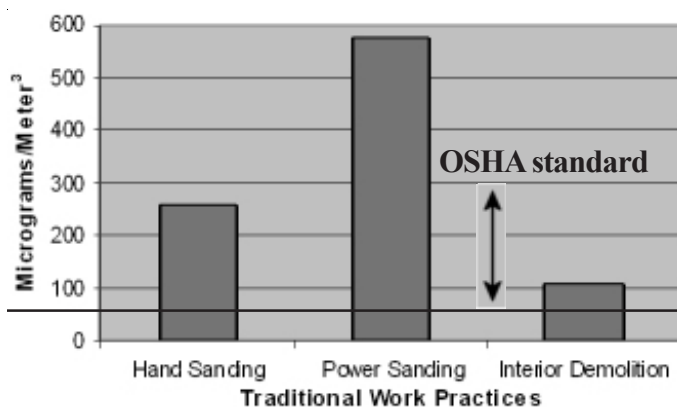
Disadvantages

- Soil can be re-exposed
- Sod covering will require ongoing maintenance



Doing It Yourself

As a Reminder:



If you have paint with only 1 mg/cm² lead and you disturb only 1.0 ft² you will have generated.

929,000 Micrograms (ug) !

40 ug/ft² on floors is hazardous for kids.

50 ug/m³ in the air is the OSHA Maximum Exposure Level

For Minor work on doors, windows and other wood components:

Contain the floor 5 feet beyond the work area and move furnishings away.

Work wet.

Don't track the dust off the floor containment.

Clean the area thoroughly when finished.

For Repainting or repairing for wallpaper:

Contain the entire area. Move furnishings out of the area or seal them with plastic sheeting.

Seal the room or area and install signs to keep others out, especially children.

Limit sanding or scraping and always mist first.

Clean your shoes and clothes when you leave the work area.

HEPA vac, wet wash, and HEPA vac again, the area when finished.

For Removing carpet:

Seal the room and hang signs.

Cut the carpet and pad into small sections.

Mist the surface of the carpet thoroughly.

Roll the carpet and pad inward misting the pad and subfloor as you proceed.

Seal the sections in poly before you remove them from the room.

HEPA vac, wash, HEPA vac the area when finished.

For Exterior work:

Cover the ground enough to catch any material you disturb.

Cover gardens, plants, and play areas.

Rope off the work area to keep people out.

Close all windows and doors.

Work wet or use HEPA attached power tools.

Pick up all visible paint chips when finished.



Containment

Containment is an inexact science but the goal is always the same: to contain ALL the dust and debris. The hazards can be existing or problems generated during remodeling, painting, weatherization or any other construction activities.

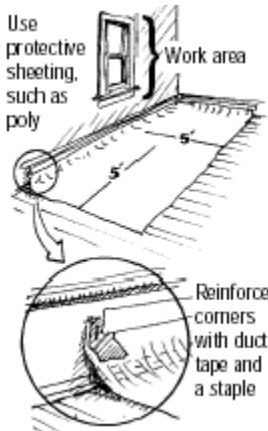


It doesn't matter how containment is done. It only matters that it is done.

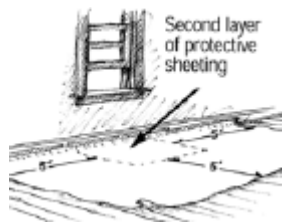
Restrict Access in the Work Area

Restricting access to the work area will avoid unnecessary exposure to people not properly trained, *especially children*.

Place a barrier across the entrances. This will remind nonworkers to stay away.



For smaller jobs, place protective 6-mil poly sheeting on the floor extending as needed to contain the debris. For most jobs about 5 feet from beyond the work area will be enough. Secure the poly under the work area using a combination of staples and tape. In many cases it will be easier to seal the entire floor.



In high traffic or work areas, install a second sheet of poly for extra protection.

Don't forget to seal all HVAC vents in the area.

Personal Belongings aka "Stuff"

There are only three ways to deal with "stuff" in a work area.

- 1 **Move it** out of the work zone - (the best way).
- 2 **Contain it** from the dust - (tightly sealed).
- 3 **Clean it** thoroughly when the job is done - (usually harder than containment and cleaning is generally not effective on cloth items).



Containment

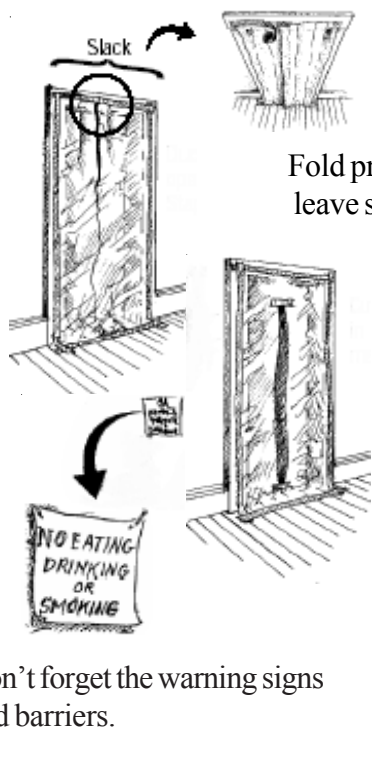
Paint scraping and demolition can create large amounts of dust. When these, or other high dust activities are planned, it will be necessary to construct an airlock. An airlock is any containment that allows people access to the work area but keeps most of the dust from spreading.

Containment is any device that separates the work area from the non-work area.



If a job creates extremely high amounts of dust seek professional help.

Use this “*Slit Door*” system to keep dust from spreading.



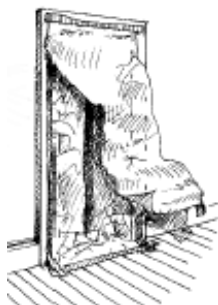
Duct tape protective sheeting to the entire perimeter of the opening. Leave slack at the top and bottom. Staple corners for reinforcement.

Fold protective sheeting at top and bottom before taping to leave slack.

Cut slit in the sheeting to within 6" of top and 3" of the bottom. Duct tape the ends of the cuts for reinforcement.

Then tape another sheet of poly to the top of door only. Roll the bottom just short of the floor and tape. Or tape a scrap of wood to the bottom for weight. Staple top corners.

Don't forget the warning signs and barriers.



Exterior Containment

Cover the ground with protective sheeting

If space permits, extend the sheeting at least 10 feet from work area or as needed to contain debris.

Cover nearby vegetable gardens and children's play areas.

Close nearby doors and windows or seal them if the job generates high dust levels.

Limit work area access

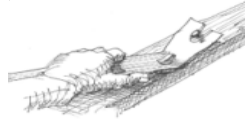
Establish a 20 foot perimeter around work area if space permits. Remember barriers and signs.



Lead-Safe Work Practices

Disassembling or Demolishing Building Components

Before removing any component mist the seams first.
 Then cut the seams with a razor knife.
 If possible, pull the nails holding it or drive them through with a nail punch.



These practices will greatly reduce the amount of lead dust and debris generated and exposure to everyone.

Paint Removal

You should understand by now that **dry, uncontained**, lead-dust is the most dangerous of all. This created when dry **scraping, grinding, sanding, drilling, sawing, planing or demolition** is done.



The easiest way to prevent this is to simply keep the surface wet. It doesn't take a great deal of water. The surface just has to be misted.



Hint: If small areas need to be drilled, sawn or cut, try using shaving foam.

If **chemical strippers** are being used, read and follow all the recommendations in the "Material Safety Data Sheets". These MSDS are available where you buy the products.

Heat guns used to strip paint should be below 750° Fahrenheit. Even this low temperature can burn paint and be extremely dangerous. Use heat guns sparingly to just soften the paint.

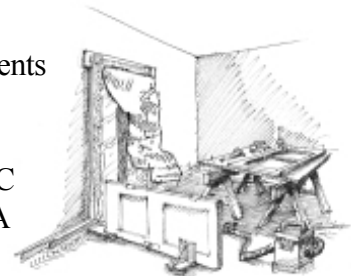


Tool shroud



Power sanders and grinders can be used without water if they are "Local Exhaust Tools" (LET). A LET has a shroud around the work area of the tool and is connected to a HEPA vacuum. The vacuum will create negative air pressure within the shroud area and *most* of the dust will be drawn into the HEPA vac.

A **dust room** is an option that should be considered when working on components that can be moved. Set up the room so that it is isolated from occupied areas. Separate this work area from non-work areas with an airlock door. Note that the flap should be on the work side of the door. Seal the floor and all the HVAC vents in the area. Clean this room with the 3 step, HEPA vac., wet wash, HEPA vac., system when finished.



Lead-Safe Work Practices

Removing Carpet

Carpet removal can be one of the most dangerous do-it-yourself jobs. If lead-dust is generated or tracked into your house, it will settle into the carpet. Over the years it penetrates through the carpet and the pad and will lie on the sub-flooring. No amount of vacuuming can pull it back out. If you remove or have carpet removed, great care must be taken. **The 6 steps to removing carpet safely are:**

1) Contain the work area from the non-work areas.

2) Cut the carpet and pad into small (manageable) sections.

3) Wet the carpet and pad as needed. Remember, if you can see dust flying, it's not wet enough. A garden hose may be needed.



4) Roll the carpet and pad inward. Wet the backside as you roll.

5) Bag or seal the debris before moving it out of the work area.

6) Clean the area thoroughly with the 3-step program. HEPA vac, wash, HEPA vac.

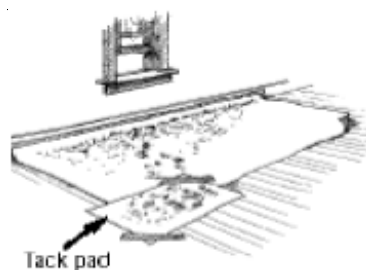
Additional Items

As official as this dust mask looks, it is not the best protection. The packaging may even say "Respirator" but it is not. While it is better protection than nothing at all, it cannot be properly fit tested.



Here is a "half-face" respirator with HEPA filters. In this illustration a "negative fit test" is being done. The HEPA filters are covered while taking a slight breath. Any leaks in the seal can be detected this way.

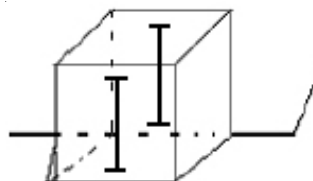
Disposable suits and shoe coverings are recommended



For smaller jobs use a tack pad to keep dust in the work area. These pads have a sticky surface that will trap dust and chips from shoe soles. Or HEPA vacuum and wipe shoes before leaving the area.



A mini containment or decontamination chamber can be used in high dust jobs. In it, workers can remove or decontaminate their work clothes before leaving the job site. The frame can be constructed with 2"x2"s and then wrapped in 6-mil poly. A slit door is installed at each end. The door flaps should be inside the chamber.



Lead-Safe Work Practices

Before you leave the work area:

Remove shoe coverings, HEPA vacuum or wipe shoes.

Remove coveralls or HEPA vacuum clothes.

Change your clothes and dispose of or place in plastic bag and wash separately from household laundry.

Wash your hands and face whenever you leave your work area.

Shower and wash your hair right after finishing work to prevent spreading lead dust.



UN-Safe Work Practices



NO

- DRY SCRAPING OR SANDING
- UN-CONTAINED WATER OR ABRASIVE BLASTING
- MECHANICAL GRINDING/SANDING WITHOUT HEPA ATTACHMENTS
- OPEN FLAME BURNING OR CUTTING
- HEAT GUNS HOTTER THAN 750° F
- METHYLENE CHLORIDE-BASED STRIPPERS
- VACUUMING WITH HOUSEHOLD VACUUM OR SHOP VAC
- DISPOSAL OF WASTE IN RESIDENT TRASH
- DISPOSAL OF WATER IN RESIDENT SINKS, BATHTUBS, OR YARD

Clean Up



Is The Most Important Part Of The Job



If clean up is not done properly, your home could be more hazardous than before work began.

Start by picking up large debris.

Mist the area and shovel or sweep paint chips and smaller debris into bags.

Wrap this in poly or place it in bags and label as “LEAD CONTAMINATED”.



HEPA vacuum the poly sheeting and fold with the dirty side inward.



Working from the top to bottom and from the cleanest area to the dirtiest area, HEPA vacuum all surfaces. Pay special attention to the horizontal surfaces. If the area is carpeted, vacuum very slowly. For small jobs, vacuum at least 2’ beyond the floor containment.

Remember: never use a house or shop type vacuum that does not have a HEPA filter.

Now wash the area using a 3-step process.

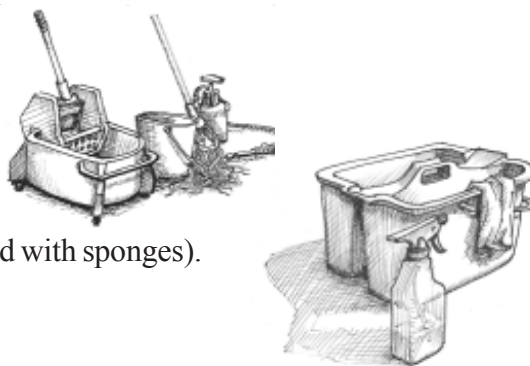
You will need a mop or sponges.

An empty mop bucket with a wringer.

A bucket with clean water.

(or you can use a 2-sided bucket for small areas to be leaned with sponges).

And a supply of all-purpose cleaner and water.



1 Pour or spray a liberal amount of cleaner on the area.

2 Mop or wipe in a “S” pattern to keep the debris ahead of the tool being used. Even if you don’t see anything, imagine it’s there. Wring this into the wringer bucket.

3 Fill the mop or sponge from the clean water bucket and wring again into the wringer bucket.

As a final step, HEPA vacuum the entire area again.

Clearance testing after any activity that disturbs painted surfaces is always recommended.

These steps, if done correctly, have been shown to control dangerous lead levels.

Clearance Testing

A clearance test, or inspection, takes place after all work and cleaning is complete. It is meant to insure that the work was done correctly and that no lead dust was left behind.

The following story and math exercise will illustrate how quickly a home can become contaminated with lead dust and the need for clearance testing.

But first let's review the "action levels" of paint and dust.

LBP is a coating that exceeds 1.0 milligram of lead per square centimeter or **1.0 mg/cm²**.

Floor dust cannot exceed 40 micrograms of lead per square foot or **40 ug/ft²**.
(4.7% of the children exposed to 40 ug/ft² will have high blood lead levels.)



Suppose a kitchen is painted with lead and the level is exactly **1.0 mg/cm²**. During a remodel or repair **only 1 square foot** of the paint is disturbed and turned into dust. The dust is then evenly spread over the 10'x10' floor and not cleaned up. If a dust test is done the reading will be about

9,290 Micrograms Per Square Foot!

Even if the paint was only **0.5 mg/cm²**, which is not considered lead-based, there would still be about **4,645 micrograms per square foot** given the story above.



Remember, the older a home, the more likely it is to have lead in the paint. And the amount will be greater with age. A home built in 1945 could easily have 9.0 mg/cm² or more lead paint in the kitchen.

The Three Step Process for Clearance

1

To review the scope and specifications of the work and see that it has been accomplished. If this were an abatement project, the examiner would see that all treatments meet the 20-year requirement. If enclosure were done, he would insure that all seams are "dust tight". If an encapsulation product had been applied, the examiner may want to do a "patch test".

2

The examiner will look for settled dust or debris on all horizontal surfaces. The review above shows it is very easy to contaminate a room or house. Lead dust at 40 ug/cm² cannot be seen with a naked eye, so if dust is still visible the clearance fails.

3

Dust testing is the main tool for clearance. It proves that the clean-up was completed to the appropriate level. Not all rooms in the "work area" will be sampled. The examiner will choose the rooms and the areas within the room to test.

Waste Disposal

An important step of lead-safe work is proper waste disposal. Typically the debris is considered household waste, so it is not subject to Resource Conservation and Recovery Act (RCRA) testing and disposal regulations. If done correctly, the lead you removed from your home will not be reintroduced into the environment.

Working with lead produces many types of waste materials including lead-based paint chips, liquid waste, used cleaning materials, and lead painted doors and windows.

The steps to good waste disposal are:

- + All waste should be labeled as “LEAD CONTAMINATED”. This will warn others of the danger.
- + Always collect, bag and seal waste at the work site and in the work area.
- + Store all waste in a secure container or dumpster until disposal.
- + Service HEPA vacuums out of doors in good ventilation and with proper worker protection.
- Do not carry the waste from the work area before it is bagged and labeled.
- Do not keep waste materials like doors, windows, and scraps of wood for other uses.
- Do not allow anyone else to keep or use them.
- Never burn lead-painted wood. This creates hazardous lead fumes.

Avoid transporting waste in an open truck.



If it must be transported in an open truck, cover the load tightly with a tarp.

Water used for clean up should be kept to a minimum.

Filter out as much of the debris and chips as possible.

Dump the waste water only into a toilet.

NEVER dump water into a sink, bathtub, shower, storm drain or on the ground.



Lead Professionals



**Have the correct background;
Have taken the appropriate classes; and
Hold certificates from the Oregon Department of Human Services
and/or EPA.**

Inspector - 3-day training

An inspector will primarily test the painted surfaces in your home and report the results. He will use an XRF device described on page 25. For a complete inspection, approximately 11 painted surfaces will be tested in each room. In most cases, he will not have to take a paint chip or disturb any surfaces. The report will show the lead content of each tested component. He can also perform clearance tests.

Risk Assessor - 2-day training plus Inspector training

The primary job of a Risk Assessor is to look for lead *hazards* in the home. He will visually review the paint conditions in each room. Paint chip samples may need to be taken. Several soil samples and 8 to 10 dust wipe tests will be performed. Water may or may not be sampled. Once the lab results are back, a report will outline the hazards found. The report should also contain suggestions to eliminate the hazards. A Risk Assessor can also perform clearance tests.

Lead Abatement Supervisor - 4-day training

A Lead Supervisor is required for all lead abatement work. He will insure that lead-safe work practices are being used. Lead-dust exposure to his workers and to the residents are his responsibility. He may not be present at the site during all the work but should visit it often.



Lead Abatement Worker - 2-day training

As you might expect, a lead worker will do the work. But he has had in-depth training on how to safeguard himself, the residents and their belongings.

Project Designer - 1-day training plus Lead Supervisor training

The Project Designer has had additional training for lead abatement and critical path planning. A Project Designer is usually needed only on very large housing and commercial abatement projects.

Lead-Safe Worker - 1-day training

There are several HUD/EPA Lead-Safe Work Practices courses offered. Most are 6 to 8 hours and give the very basics of working lead-safe. The students do NOT receive a DHS or EPA certificate to perform abatement.

More Information



Local

Oregon Department of Human Services (formerly Oregon Health Division) also has *information on lead-safe work practices* for do-it-yourself home renovators, contractors and landlords.

(503) 731-4012

www.healthoregon.org/leadpaint

Oregon LeadLine offers *general information* on lead poisoning, blood lead screening, water testing, lead paint removal grants, safe work practices, in-home risk assessments and other lead-based paint services. Information is available for english and non-english speakers.

Portland (503) 988-4000

metro

Statewide (800) 368-5060

toll free

www.leadline.org

Western Regional Lead Training Center at Oregon State University *provides training* for lead professionals in OR, WA, ID, and AK. This training is certified by the State of Oregon and the EPA. Additional classes include Lead-Safe Work Practices, Lead-Safe Weatherization, Clearance Technician, and Lead Awareness. (541) 737-6839

www.ccee.oregonstate.edu/wrltc

National

U.S. Department of Housing and Urban Development *manages standards and programs* to prevent lead poisoning in federal or federally-assisted low-income housing.

Healthy Homes and Lead Hazard Control (202) 755-1785 x104

www.hud.gov/offices/lead

The **Environmental Protection Agency (EPA)** *administers national policies* about lead and other environmental hazards. For EPA publications relating to lead and other information, call

The National Lead Information Center. 1-800-424-LEAD

www.epa.gov/lead

U.S. Consumer Product Safety Commission: *information on dangerous consumer products.*

Send e-mail to report hazardous products to:

info@cpsc.gov

Hotline: 1-800-638-2772

www.cpsc.gov

Alliance for Healthy Homes has a wealth of *information on national and local lead-poisoning prevention efforts*, as well as current efforts to sue the lead paint industry.

www.afhh.org



Finding a Lead-Safe Contractor

To be sure the contractor will work lead-safe ask the following questions.

Are you registered with the Construction Contractors Board? What is your registration number?

If there are subcontractors, are those firms registered? What are their registration numbers?

How long has your company been in the remodeling business?

Do you or your supervisors, workers or staff hold any professional certifications?

Has your staff been trained in lead-safe work practices? Which classes?

Prior to starting work, will you provide a copy of the pamphlet, *“Protect Your Family from Lead in Your Home”* as required by federal regulations?

Does your company use lead-safe remodeling practices endorsed by the Oregon Lead Based Paint Program?

What is your Lead-Based Paint Permit number?

Can you give me three recent references (with phone numbers) of clients who have had similar work done?

Will you post lead hazard warning signs and barriers around the work area?

How will you keep dust and debris from contaminating my house and yard?

What type of daily clean-up practices will you use?

What type of final cleaning practices will you use?

Will there be a Clearance Test done at the end of the job? Who will perform it?

Will your written contract include lead-safe work practices means and methods?

For more information about lead-safe remodeling, lead-based paint hazards and testing and professional lead-based services phone the Oregon Health Division’s Lead Line at 503-731-4012

You can check on complaints against a contractor or confirm their registration number by contacting the Construction Contractors Board at 503-378-4621, ext. 4900 or 888-366-5635. The CCB web site is www.ccb.state.or.us For a list of remodelers trained in lead-safe work practices contact the Oregon Remodelers Association at 503-788-2274

If you would prefer to have this document provided to you in larger type, please phone 503-731-4012

