



Lead-based paint abatement

The Lead-Based Paint Hazard Reduction Act of 1992 states “abatement” refers to the methods used to permanently get rid of lead-based paint hazards. HUD has defined permanent as lasting at least 20 years. Getting rid of lead-based paint hazards means making lead-based paint unavailable, so that it is no longer a hazard. Remember, EPA defines a “paint-lead hazard” as

- lead-based paint on any friction surface that rubs against another surface and creates a dust-lead hazard
- lead-based paint that is damaged or deteriorated on any impact surface
- any chewable lead-painted surface on which there is evidence of teeth marks
- any other deteriorated lead-based paint on the inside or outside of any residential building or child-occupied facility.

There are four basic methods of lead abatement:

- **replacement**—removing the building part with lead-based paint on it and replacing it with a new one;
- **enclosure**—covering the lead-based paint with a solid barrier;
- **encapsulation**—coating the lead-based painted surface so that it is not accessible;
- **paint removal.**

Enclosure and encapsulation are permanent solutions, but these methods do not remove the lead-based paint; they abate the lead-based paint hazard.

Four methods of lead abatement

- **replace;**
- **enclose;**
- **encapsulate;**
- **remove.**



Replacement is a permanent solution.

Replacement can create a lot of dust.

Replacement

Replacement means removing the lead-painted building part (such as a window) and replacing it with a new one that is not painted with lead-based paint. This method is mostly recommended for windows, doors, and other woodwork that are painted with lead-based paint.

Advantages

Replacement is the easiest and quickest way to get rid of lead-based paint. Replacement removes lead-based paint forever. It is a **permanent solution**. When combined with overall modernization, replacing windows can upgrade the building itself. Replacement can lower heating bills and maintenance costs.

Disadvantages

Replacement is expensive. It takes a lot of work. Skilled carpenters are often needed to put in the new parts—especially windows and doors. Surfaces next to the part being removed may get damaged. The replacement part may not be as good as the original.

Replacement can involve demolition work. It can create a lot of dust. To keep lead levels down, wet mist and HEPA (High Efficiency Particulate Air)-vacuum the old building part before removing it.



Replacement often requires manual demolition. Old building parts must be torn out and removed. Manual demolition is a Class 1 task under OSHA. You must wear an appropriate respirator and protective clothing unless your employer has sampled the air for lead and this job does not release a lot of lead dust into the air. Lead abatement tasks are identified in OSHA's Lead in Construction Standard and defined in Chapter 3 of this manual. After removing the building part, wet mist the part again, wrap it in poly, and seal it with duct tape. Store it until it can be disposed of properly. Wet down and clean up debris as you work. This helps keep lead dust levels down. You will learn more about cleanup and waste disposal in Chapter 8.



Enclosure

Enclosure means covering the lead-based paint with a solid, dust-tight barrier. The lead-based paint is enclosed behind the barrier. An enclosure keeps the lead-based paint away from the rest of the building. It keeps lead away from the building occupants.

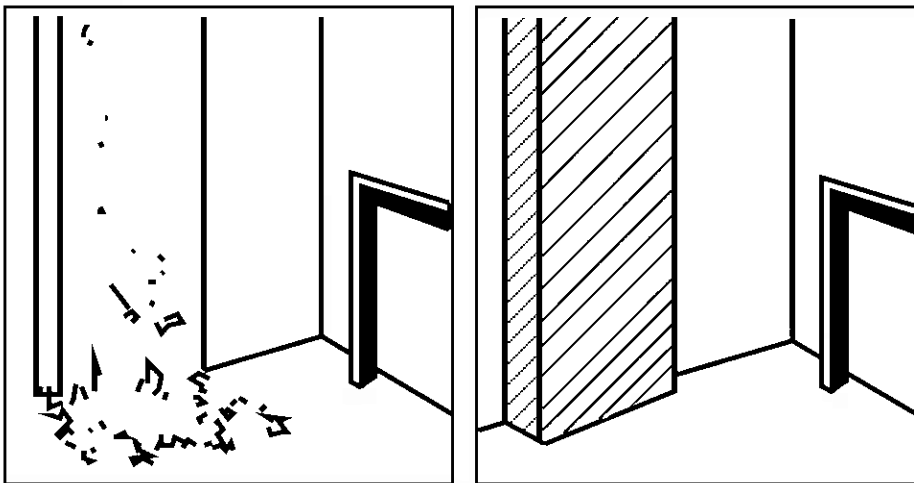
The materials used to enclose the lead-painted surface must be durable. Common materials used to build enclosures include:

- underlayment
- aluminum
- panelling
- fiber board
- vinyl
- plywood
- drywall
- tile
- acrylic sheets

Wall paper and contact paper are **not** enclosure materials. They are not dust-tight.

Before you enclose a surface, remove all peeling and chipping paint. Also fix any “source problems” such as water leaks or moisture sources. If source problems are not fixed, the enclosure that you build will get damaged and fail. After fixing the source problem, HEPA vacuum the area to be enclosed. This will collect any loose lead dust.

An enclosure is a dust-tight, solid barrier.



AN ENCLOSURE KEEPS LEAD-BASED PAINT AWAY FROM OCCUPANTS AND THE REST OF THE BUILDING.



An enclosure prevents lead dust from leaking out.

Label the surface “LEAD-BASED PAINT” before you enclose it. Use spray paint or something similar.

When you enclose a surface, make sure that the lead dust will not leak out of the edges or seams. Seal all seams with caulk. Back-caulk the perimeter of the enclosure material before you install it. Then mechanically attach the enclosure material to the lead-painted surface. Use nails or screws. You need to use both adhesive and physical fasteners to create a dust-tight seal. A dust-tight seal prevents lead-dust leaks.

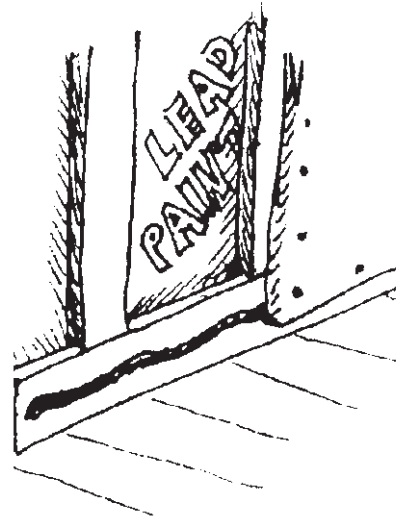
The new surface must stay in place. The enclosure must be made so that no one, especially not a small child, can remove it. The enclosure material must be strong and durable. If there are building plans, the areas where enclosures cover lead-based paint need to be marked and identified in the plan. This will show workers who work in the building in the future that lead is located there.

Advantages

Enclosures are made using locally available construction materials. Enclosures are durable and, if done right, don't create much waste or dust.

Disadvantages

Enclosure does not permanently remove the lead-based paint. The lead source still remains underneath the covering. Renovation or repair work to enclosed surfaces will disturb the lead-based paint. It will release lead dust that has collected behind the enclosure barrier. Enclosed surfaces and joints of the enclosures must be monitored for damage and deterioration.



An enclosure does not permanently remove lead-based paint.



Encapsulation

Encapsulation means coating the lead-painted surface with a thick, durable sealing material. Surface preparation is critical when encapsulants are used. Some systems include a mesh as well. The coating prevents lead dust from being released. Encapsulants are best used on building materials that are in good condition. You need an encapsulant with mesh for surfaces that have some chipping or peeling.

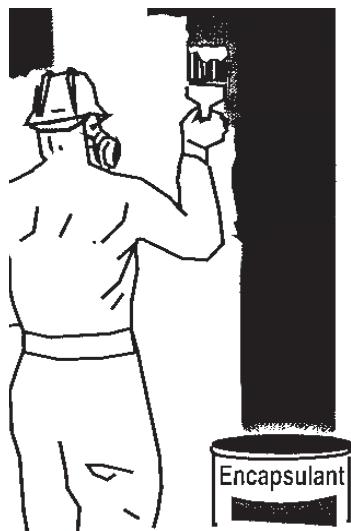
Encapsulants must be strong enough so you can not easily break or chip the surface. They must completely cover the lead surface and have a dust-tight seal. Encapsulants must be flexible and strong. You should not be able to damage the encapsulated surface with impact. Make sure that the encapsulant you use is not toxic and that it is flame resistant. Read the MSDS (Material Safety Data Sheet). Wallpaper, contact paper, and new paint **are not** encapsulants.

There are many different kinds of encapsulants on the market. The quality and reliability of encapsulants vary greatly. ASTM has developed three standards for encapsulants. Only encapsulants that meet these standards should be used. Check your state and local laws. In some areas of the country, encapsulants must be approved by state or local government on a case-by-case basis.

Preparing the surface

You must follow all of the manufacturer's instructions on how to prepare the surface. The wall or surface must be in good condition to use encapsulants. Encapsulation will not work if the wall is separating from the wood or lath. It will not work if the plaster is separating. It will not work if the surface is very damaged or deteriorated.

The surface to be covered needs to be prepared first. Moisture sources must be removed and the surface allowed to dry. Peeling paint should be wet scraped. The surface should be wet cleaned and allowed to dry. (You can use a HEPA vacuum to clean the surface if a wet cleaning is not recommended by the manufacturer.) If these steps are skipped, the encapsulant will fail.



Applying the encapsulant

You must follow all of the manufacturer's instructions on how to apply the encapsulant. Encapsulants are usually easy to apply. Often they can be applied like you apply paint. **If the encapsulant is improperly applied, it will fail.** It can separate from the paint. This will cause the paint to peel and create lead dust.

It is best to use encapsulants on building materials that are in good condition.

Make sure it is legal to use the encapsulant in your local area.

You must prepare the surface.

Follow directions when you use an encapsulant.



Always do a "test patch."

Encapsulation does not remove the lead-based paint.

Doing a test patch

Not all encapsulants can be used on all surfaces. Some encapsulants will not work on certain surfaces. For this reason, you must do a "test patch" of the encapsulant on the surface to be covered. Read and follow the manufacturer's instructions. If the test patch bubbles or cracks, then it has failed. If the test fails, do not use this encapsulant on this surface. Test other encapsulants or use another abatement method.

Using the right personal protective equipment

The type of personal protective equipment you need depends on the type of encapsulant you use. Suits and respirators should be worn when you do any repair work before applying the encapsulant. For some chemical encapsulants, you will need special filters, and chemical-resistant gloves and suits. When using some encapsulants you will need to use an organic vapor filter as well as a HEPA filter on your respirator.

Make sure the area has a good flow of air. You might need extra ventilation. Good ventilation is very important when using an encapsulant. Be sure to check the product's MSDS for specific safety measures.

Advantages

Encapsulation usually does not generate a lot of dust. It may be less costly than other abatement options. A wide range of products meeting the ASTM standards is available.

Disadvantages

Encapsulation does not permanently remove the lead-based paint. The lead source still remains underneath the covering. Any renovation or repair work to encapsulated surfaces will disturb the lead-based paint. Encapsulants do not work on all surfaces. They need to be tested. "Patch testing" the encapsulant takes time.

Encapsulated surfaces need to be inspected regularly for damage and deterioration. Encapsulants can fail, especially if the underlying surface was not properly prepared or the encapsulant was not applied correctly. Sometimes encapsulants separate from the surface. This is called encapsulant failure. Encapsulants should not be used on impact or friction surfaces.

Using some encapsulant products may create hazardous waste. Hazardous waste has to be disposed of properly. You will learn about disposal of hazardous waste in Chapter 8.



Paint removal

Removal means taking off lead-based paint. **Removal methods create a lot of lead dust and waste.** To begin, wet mist and HEPA vacuum old building parts. Clean up debris as you work. Keep lead-dust levels down. Paint can be removed by using one or more of the following methods:

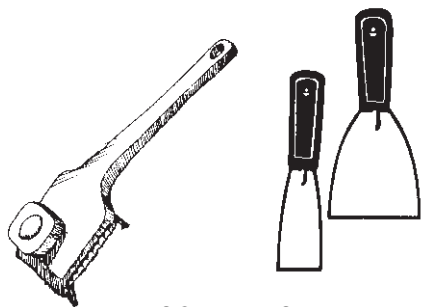
- wet scraping down to the substrate
- wet planing
- using electric heat guns
- using local-exhaust hand tools
- chemical stripping
- vacuum and water blasting (exterior only)

Wet scraping

Wet scraping means misting loose paint before scraping it. Dry scraping paint creates a huge amount of dust. Avoid dry scraping lead-based paint. Mist the loose paint before you scrape it. Continue to wet it while you scrape. Doing this keeps lead dust levels down.

Wet scraping is often used to prepare a surface for painting. It does not mean removing all of the paint—only the loose paint. Wet scraping and painting can be used as an interim control.

WARNING: Never wet surfaces near electrical outlets even if the circuit is turned off. You could get an electric shock.



SCRAPERS

A scraper is a blade-like tool used to remove paint. They come in different sizes. Scrapers should be kept sharp at all times. A mill file is good for keeping scrapers sharp.

Clean up the paint scrapings and dust as you work. Wet and bag the debris as you go. This keeps lead-dust levels down.

Manual scraping is a Class 1 task. To be

safe, wear appropriate respiratory protection and disposable suit, gloves, and goggles when you wet scrape. You will get a lot of paint chips and lead dust on your disposable suit. HEPA vacuum the outside of your suit as you exit the work area.

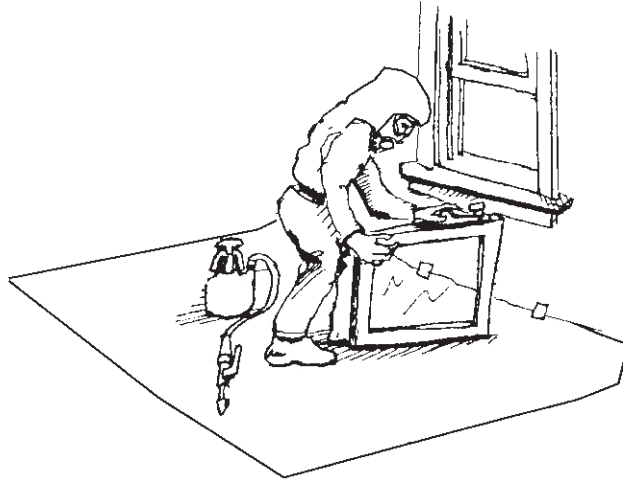
Removal methods create a lot of lead dust.

Wet the paint before you scrape it.

Clean up as you work.



Wet the paint before you plane it.



Wet planing

Wet planing is much like wet scraping. It means misting the surface before you plane it. Wet planing creates dust. Wear a respirator and protective clothing to be safe.

A plane is a carpenter's tool for shaving a wooden surface. You can use a plane to remove lead-based paint from impact surfaces such as

the edges of a door. You can use a plane on friction surfaces such as the edges of windows that rub together when you open or close the window.

Electric heat guns

Heat guns that generate heat of 1,100° F or more are prohibited. Electric heat guns may be used to force warmed air onto a painted surface. The heat softens the paint. The loosened paint is then scraped off with hand tools.

Use heat guns very carefully. Heat guns can cause serious burns on your skin. They can damage the building material from which you are removing paint. They can even cause a fire. Before using a heat gun, check the building material and the other side of the wall. Heat guns can ignite a fire on the other side of the surface material. **Have an ABC (multiuse) fire extinguisher on hand.**

Heat guns that operate at 1,100° F or more can cause lead-based paint to produce toxic fumes. Fumes are created when a metal is heated. Lead fumes contain many tiny particles of lead. These tiny particles are very easy to breathe. The lead fumes quickly travel deep into your lungs and then cross into the blood. Heat can also cause the paint to release organic vapors. Organic vapors come from chemicals used to make paint. High heat can turn the chemicals into dangerous vapors.



Do not use a heat gun above 1,100° F.

Heat guns can burn you and the building.

Heat guns can create dangerous lead fumes.





You should wear a Powered Air Purifying Respirator (PAPR) when you use a heat gun to protect yourself against dust and fumes. The PAPR should have both a HEPA filter and an organic vapor cartridge. Some states say you **must** wear a PAPR when using a heat gun. You are dry scraping when you use a heat gun. This could create a lot of dust. Using a heat gun is a Class 1 task. The OSHA Lead Standard says you can ask your employer for a PAPR. If you ask for a PAPR, your employer must provide you one if you are working above the PEL and it is protective against the contaminants in your work area.

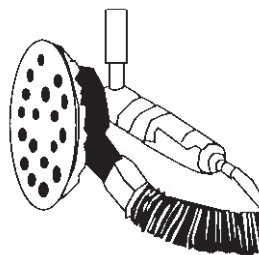
Local exhaust hand tools

Local exhaust hand tools are power tools that you can hold in your hand. They have a hose that attaches to a vacuum, which has a HEPA filter. This system is called a local HEPA exhaust system. There are a number of local exhaust hand tools for lead-abatement work. Using local exhaust hand tools is a Class 1 task.

Follow the manufacturer's instructions for proper use of local exhaust hand tools. Never remove or pull back the shroud or cover. The cover is needed for the vacuum to work. Shrouded tools are difficult to use. Sometimes you cannot see what you are doing. **You must move the tool very slowly to keep the shroud in place.** The tool must be used flat against the surface. If you work too fast, the shroud seal will break and lead dust will get into the air.

- **HEPA sanders**

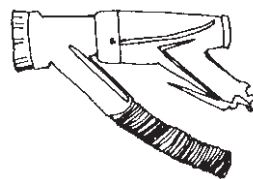
Sanding generates huge amounts of dust. A HEPA sander is a power sander fitted with a HEPA vacuum to catch and filter lead dust as it is created. Always use a HEPA sander when you sand lead-based paint. Limit the use of HEPA sanding to flat surfaces for feathering or finishing only.



HEPA SANDER

- **Needle gun with HEPA filter**

A needle gun has many metal rods. The rods are contained inside a shroud (cover). The rods loosen and break the surface paint. The shroud catches most of the lead dust. The local exhaust pulls them into the HEPA filter.



HEPA NEEDLE GUN

Needle guns are best used on metal or masonry surfaces. They are useful on pipes and structural steel. They will damage wood surfaces. **Wear hearing protection when you use a needle gun.**

Local exhaust tools have a HEPA vacuum attached to them.

Sanding generates large amounts of dust.

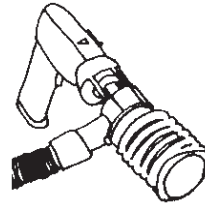


Do not use sanders, saws, drills, or needle guns without a HEPA attachment.

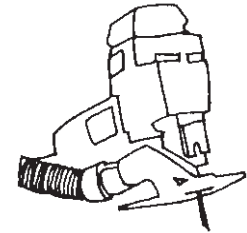
Chemical stripping strips paint with solvents or caustic paste.

- **HEPA saws and drills**

Other hand tools, such as saws and drills, can be fitted with HEPA exhaust systems. The HEPA system catches and filters most of the lead dust as it is created. The drill, like the needle gun, has a cover. **Wear hearing protection when you use a HEPA saw or drill.**



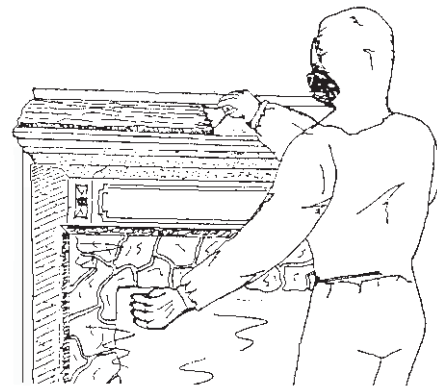
HEPA DRILL



HEPA SAW

Chemical stripping

The use of chemicals in the form of solvents or caustic paste to strip off paint is called chemical stripping. Chemical solvents dissolve the paint. Caustic paste melts paint into a goo that is scraped off with hand tools. Chemical stripping always involves manual scraping. **Wear eye protection, a respirator, and protective clothing to be safe from the chemicals and from lead. Chemical strippers give off harmful chemical vapors. You will need to wear combination filters on your respirator.**



After the paint is removed, carefully clean the surface. Then use a special rinse to neutralize the surface. The rinse balances the acid or base of the stripping chemicals. Check with pH indicators to make sure the neutralizer worked. Repainted surfaces will fail if the caustic paint stripper is not completely removed and the surface is not neutralized. The surface may need to be smoothed and reglued before it is repainted.

Chemical stripping can be done on- or off-site. When chemical stripping is done off-site or when you send painted material off-site to be stripped, you should wet down and clean up any debris generated when you remove the component. Mark the component in order to identify the place that it was removed from. Place such markings in an out-of-the-way place. Be sure to use markings that will not be removed by stripping products (i.e., engraving). Mist the building part with water and remove it. Wrap it in poly. You may need to wear a respirator and protective clothing when you do this.

Send the component to a professional stripping shop. At the shop it will be dipped in a tank full of chemical stripping agents. The paint will dissolve right off the surface.

Abatement Methods



When the component is returned, be sure to wash it before you reinstall it. Make sure it is properly neutralized. You may also need to refinish and reglue it. Remember to wear a respirator if you sand the surface—chemical stripping always leaves some lead behind.

Advantages

Chemical paint strippers are useful to preserve the detail on decorative doors, molding, and trims. They are used on old antique trims or molding that can not be replaced.

Sending the work somewhere else keeps hazardous chemical strippers out of your work area.

Disadvantages

Chemical strippers may create hazardous waste. Strippers are often made of hazardous materials and may have to be disposed of as hazardous waste. The liquid waste generated through rinsing and cleaning may also be hazardous waste. Hazardous waste has to be contained and disposed of in a special way. It must be handled correctly, or it can hurt workers and the environment. Sending the work off-site protects you and your work site. It does not protect the work site or workers where the stripping takes place. Your employer is required to find out if each job generates hazardous waste.

Chemical stripping leaves some lead behind. This leftover lead soaks into the pores and cracks of a surface, especially wood, where it hardens. Wear a respirator if you sand the surface. Clean the stripped surface carefully, or the leftover lead will mix with the new non-lead-based paint. When the new paint chalks, chips, or peels, the lead will get into the dust all over again. Clean up any dust or debris using wet cleaning methods and HEPA vacuuming.

Caustic strippers can damage the building material.

Leftover stripper will cause the new paint coat to fail. It will damage the building material. This can happen if the surface was not cleaned properly. Cleaning is an important job that takes a lot of time. Another reason the new paint might fail is that the neutralizer did not work properly. It is very important to test the surface to see if the neutralizer has worked. If the surface is not neutral, you must clean and neutralize it again. Do this process over and over until the surface is neutral. This could take days.

Removing a building component for off-site stripping will create dust. An old building component may break when you try to remove it. To keep dust levels down, mist the component with water before you remove it. Wet down and clean up any debris generated. Wear the right protective gear and follow proper hygiene practices.

Chemical strippers are dangerous!

Material Safety Data Sheets (MSDSs) give you safety instructions about using chemical products.

Chemical stripping creates hazardous waste—both on site and off site.



Read your Material Safety Data Sheets.

Any chemical that can remove paint will harm you if it touches your skin or gets in your eyes.

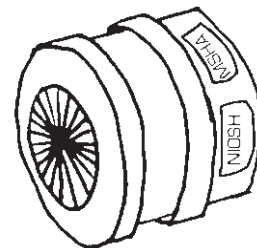
Caustic strippers will burn your skin. When you scrape a caustic, it can create a dust or mist that can get into your eyes, nose, mouth, and throat. Solvent strippers can be very dangerous. Some solvents can damage your skin, others pass through your skin into your blood. Solvents can damage your brain, nervous system, blood, liver, kidney, and heart.

- Find out where the eye-wash station is so you know where to find it if you need it.
- Never do chemical stripping above your head.
- Keep chemicals off your skin and out of your eyes.
- Wear chemical-resistant, rubber gloves and suits. Wear eye goggles and gloves that extend up your arm towards your elbows.

Some stripping chemicals have toxic vapors which you should not breathe.



- **Do not use strippers that contain methylene chloride.** Methylene chloride is extremely toxic. It can cause cancer and other major health problems.
- Only use chemical strippers in well-ventilated areas.
- Use the right respirator filters. Make sure your respirator cartridges will protect you from the chemicals in the stripper. You may need a combination filter when you are removing lead with a chemical stripper.





Some strippers can cause a fire. The vapors they give off create a fire hazard.

- Do not use them around electric heaters, heat guns, or any electrical equipment.
- Have an ABC fire extinguisher on hand.
- Have a plan in case of a fire.
- Mark and know where the emergency exits are.
- Post the emergency phone numbers.
- Know where the phone is and how to use it.
- Have a designated meeting place outside the work area.



Vacuum and water blasting (exterior methods)

Paint can be removed by vacuum blasting and water blasting. These methods are to be used for **exterior work only**. Vacuum blasting requires a HEPA vacuum. Both methods are very expensive. They create a lot of waste. They can damage the treated surface, especially wood. Neither method is used very often. **Vacuum blasting** can be used on a variety of surfaces, but it works best on flat surfaces. **Water blasting** creates waste water that is considered hazardous. It must be contained and disposed of properly.

After the lead-based paint is removed, the bare surface must be cleaned and smoothed. Then, the surface must be inspected. If it passes inspection, it can be repainted with non-lead-based paint or covered with other materials.

Only use vacuum and contained water blasting for outside work.



Torching and flame burning lead-based paint are not allowed in residential abatement.

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

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

Prohibited methods

HUD and EPA do **not** allow some methods on residential lead abatement jobs (including child-occupied facilities). These methods are not allowed because they are hazardous. They include

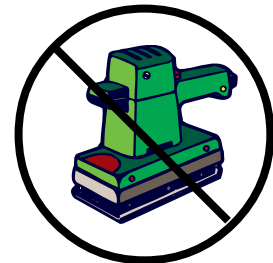
- torch or flame burning;
- machine sanding or grinding (unless equipped with a HEPA filter);
- abrasive blasting or sandblasting (unless equipped with a HEPA filter);
- dry scraping of lead-based paint*;
- using a heat gun above 1100 degrees Fahrenheit.

*Dry scraping of lead-based paint is only allowed in the following situations:

- when scraping while using a heat gun or around electrical outlets;
- when scraping defective paint spots totaling no more than two square feet in any one room, hallway or stairwell or totaling no more than 20 square feet on exterior surfaces.



NO TORCH BURNING!



NO DRY SANDING!


Additionally, HUD prohibits the use of methylene chloride paint strippers, as well as the use of other paint strippers in poorly ventilated work spaces.


Some states or localities may prohibit the use of methylene chloride paint strippers. Methylene chloride paint strippers may cause cancer.

Remember, wallpapering or repainting *are not* lead-based paint abatement methods.



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.



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 copies by calling 1-800-424-LEAD.

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

*EPA, *Lead: Requirement for Lead-Based Paint Activities in Target Housing and Child-occupied Facilities*; 40 CFR Part 745 (August 1996).

*HUD, *Requirements for Notification, Evaluation and Reduction of Lead-Based Paint Hazards in Federally Owned Residential Property and Housing Receiving Federal Assistance; Final Rule* (September 1999).

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

*NIOSH, *Preventing Lead Poisoning in Construction Workers*, NIOSH Document No. 91-116A (April 1992).

*OSHA, *Interim Final Lead in Construction Standard*, 29 CFR 1926.62 (May 1993).

OSHA, *Lead in Construction*, OSHA 3142 (1993).

*Society for Occupational and Environmental Health, *Protecting Workers and Their Communities from Lead Hazards: A Guide for Protective Work Practices and Effective Worker Training* (1993).



Lead Abatement for Workers
