Section 2

Specific Questions About Testing Paint, Dust and Soil

Q: Are All Painted Surfaces In The Home Tested?

A: Not every single painted surface in the home will be tested, but all types of painted surfaces are tested. For example, a room may have three windows, all painted the same color and all made out of wood. The Inspector may not test all three windows, because they appear to be the same.

In a similar fashion, the Inspector will go through every room and test the different types of painted surfaces in the rooms. Painted surfaces on the outside of the home, detached structures (such as garages), and items like painted fences and swingsets should also be tested.

Inspections differ from risk assessments and lead hazard screens. In a risk assessment, only deteriorated paint and paint that has been mouthed or chewed by a child will be tested. In a lead hazard screen, only deteriorated paint is tested.

Q: How Are Painted Surfaces Tested?

A: There are currently two methods recognized by EPA for testing paint: portable X-Ray Fluorescence (XRF) analyzers and paint chip sampling followed by analysis by a laboratory recognized by EPA.

I. Portable X-Ray Fluorescence Analyzers (XRFs)

A portable XRF measures lead in paint, generally without damaging the paint. However, readings from some XRFs are affected by the base material (known as the “substrate”) underneath the paint, such as wood, plaster, or metal. For these cases, the Inspector removes paint from a few surfaces of each type and takes a measurement on the unpainted surface. These measurements provide a baseline to adjust the lead in paint value. This procedure may do some paint damage. Also, for curved surfaces or very deteriorated paint, XRF analyzers may not read accurately and a paint chip sample may be required.

When a qualified lead-based paint professional follows good testing practices, XRF analyzers provide a fast and reliable method for classifying many painted surfaces. However, some XRF test results may be inconclusive (neither positive nor negative). Then laboratory testing of a paint chip sample may be necessary.

Because the XRF analyzer uses a radiation source to detect lead, occupants in the household may be asked to stay out of rooms behind the surfaces being tested.
II. Paint Chip Sampling and Laboratory Analysis

Paint chip samples are collected for laboratory analysis by removing one to four square inches of paint from the surface. All layers of paint in the sampled area are included in the sample. Usually samples will contain some of the material beneath the paint, such as wood, plaster, or concrete particles. The amount of this material will be kept to a minimum.

Tools such as chisels and scrapers are used to remove the paint. Sometimes a heat gun is used to soften the paint and make the removal easier. If so, a respirator should be worn by the person operating the heat gun for protection from lead and other fumes. In addition, the room or area should be well ventilated to protect occupants.

After collecting the paint chip sample, the professional will repair the scraped area so that adjacent paint will not peel or flake off. Any paint chips or dust from the sampling should be cleaned up by the professional to ensure no lead dust is left behind.

Paint chip samples should be analyzed for lead by a laboratory recognized by EPA as proficient for testing lead in paint. EPA has established the National Lead Laboratory Accreditation Program (NLLAP) to ensure that laboratory analyses are done accurately. A laboratory on the list is recognized as proficient for testing in whichever of the three sample types (paint, dust, or soil) the laboratory has qualified. Be sure that any paint chip samples from your home are analyzed by a laboratory on the NLLAP list for paint. A current list of NLLAP (EPA recognized) laboratories can be obtained by calling 1-800-424-LEAD.

While paint chip sampling followed by laboratory analysis is generally more accurate than XRF testing, sampling and analysis take longer to complete and paint chips must be scraped from many surfaces in the home. In some cases, a surface may be curved or so deteriorated that an XRF cannot be used properly, and sampling may be the only way to test the paint.

What Do The Results of Paint Testing Mean?

A qualified professional will use guidance specific for each type of XRF analyzer to determine whether a measurement indicates that:

- Lead-based paint is present,
- Lead-based paint is not present, or
- The measurement is inconclusive and a laboratory test is necessary.

The guidance ensures the XRF measurement classifies paint as lead-based when there is 1.0 milligram of lead per square centimeter of painted surface or greater (1 mg/cm²). An XRF analyzer typically reads in mg/cm², meaning milligrams per square centimeter.

When the paint chip sampling followed by laboratory analysis method is used, the federal definition of lead-based paint is dependent on how the results are reported.

- If the laboratory report is expressed as weight of lead per weight of paint chip, the federal definition of lead-based paint is 0.5 percent lead (0.5%). This is mathematically the same as 5,000 milligrams of lead per kilogram of paint chip (5,000 mg/kg), or 5,000 micrograms of lead per gram of paint chip (5,000 µg/g), or 5,000 parts per million lead (5,000 ppm).

- If the laboratory report is expressed as a weight of lead per unit area of painted surface, the federal definition of lead-based paint is 1.0 mg/cm² (the same as for XRF analysis).

It is possible to report laboratory results in both types of units, but this is rarely done because of the additional time and work required.
Unfortunately, there is no universal definition of lead-based paint. Some state and local governments have definitions of lead-based paint which differ from those in federal law. It is recommended that when there is a conflict between the federal definition and a state or local definition, the more stringent standard (that is, the lower number) be used to define lead-based paint. A qualified lead-based paint professional (Inspector or Risk Assessor) will be aware of and will follow the appropriate standard.

<table>
<thead>
<tr>
<th>How Test Results are Reported</th>
<th>Federal Definition of Lead-Based Paint</th>
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<tbody>
<tr>
<td>If results are reported as percent (or equivalent)</td>
<td>Paint has greater than or equal to 0.5% (or 5,000 µg/g or 5,000 mg/kg or 5,000 ppm) lead</td>
</tr>
<tr>
<td>If results are reported as milligrams per square centimeter</td>
<td>Paint has greater than or equal to 1mg/cm² lead</td>
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</table>

What If No Lead-Based Paint Is Found In My Home?

Lead can still be present in paint which is not classified as “lead-based.” This would occur when the paint has a lower amount of lead than the federal government regulates (see “What Do The Results Of Paint Testing Mean?”). If lead is present in the paint, lead dust can be released when the paint deteriorates, or is disturbed during remodeling, renovation, sanding, or some maintenance work that breaks the surface of the paint. This is especially important in homes built before 1978. Since the amount of lead in paint was limited by federal regulation in 1978, lead exposure during remodeling and renovation is not as much a concern in newer homes.

The EPA brochure *Reducing Lead Hazards When Remodeling Your Home* provides guidelines for renovation and remodeling your home. See page 15 for more information on how to order the brochure.
How Are Dust Samples Collected And Analyzed?

The most common method for dust collection is a surface wipe sample. Most Risk Assessors will use baby wipes or wet wipes to collect dust.

If dust is collected from a floor, an area of one square foot is usually sampled. The area is wiped several times in different directions to pick up all the dust. After sampling, the wipe is placed in a container and sent to a laboratory for analysis. The Risk Assessor will also collect wipe samples from windows and measure the surface area wiped.

In some situations, special types of vacuum samplers may be used for dust collection. These are different from home vacuum cleaners, although some may look the same. There are currently no federal standards for dust samples collected with vacuum techniques.

The lead-based paint professional should send dust samples to an NLLAP (EPA recognized) laboratory that is proficient for dust analysis. (A current list of NLLAP laboratories can be obtained by calling 1-800-424-LEAD.)

What Do The Results Of Dust Sampling Mean?

Dust sample results are usually expressed as a weight of lead per unit area of surface. The units will usually be micrograms of lead per square foot. For example, a floor wipe sample may be expressed as 50 micrograms of lead per square foot. This is written as 50 µg/ft².

The lead-based paint professional will provide guidance in interpreting the results of the dust testing. Federal guidelines for acceptable dust lead levels are discussed in the EPA Fact Sheet Identifying Lead Hazards In Your Home. See page 15 for details on ordering information.

How Are Soil Samples Collected And Analyzed?

Soil samples are collected from bare soil areas (soil with no grass or other covering) near your home where children play and from bare soil areas near the house foundation or dripline. Optional sampling areas are gardens, pathways, and pet sleeping areas. Samples are collected by coring or scooping methods that take the top half-inch of soil. Samples of non-bare soil may sometimes be collected.

Soil samples should be sent to an NLLAP (EPA recognized) laboratory that is proficient in soil analysis. (A current list of NLLAP laboratories can be obtained by calling 1-800-424-LEAD.)
What Do The Results Of Soil Testing Mean?

Results of soil samples are expressed as a weight of lead per unit weight of soil, usually in parts per million. For example, a soil sample result may be 300 parts per million. This is written 300 ppm.

The lead-based paint professional will help you interpret the results of the soil testing. Federal guidelines for acceptable soil lead levels are discussed in the EPA Fact Sheet, Identifying Lead Hazards In Your Home. See page 15 for details on ordering informational materials.

What Are Composite Samples?

Composite samples are combinations of individual samples analyzed together in a laboratory to obtain a single average result. Both dust and soil samples may be composited. For example, a floor dust sample may be collected in each of three rooms and combined to obtain one composite dust sample to be analyzed by the laboratory. Or, four soil samples taken in a play area may be combined to obtain one composite soil sample. Paint samples may also be composited, but this is not as common as compositing dust and soil samples.

Composite samples may often be used in risk assessments and lead hazard screens to reduce the cost of laboratory analysis, or to increase the representativeness of a single sample. The disadvantage of composite samples is that information is not available for each room (or location) from which samples were collected.

The Risk Assessor will interpret composite sample results, if any. The advantage of composite samples is that information is obtained at reduced cost, or more samples are collected for the same cost.
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What Are Home Test Kits?

Home test kits are chemical test kits which are designed to check for lead in paint, soil, and dust (and in some cases water, dishes, glasses, and ceramics). Lead is detected by a reaction that causes a color change when chemicals in the kits are exposed to lead. In one type of kit, the chemical solution turns pink, rose, or red to indicate the presence of lead. In another kit, the solution turns gray, black, or brown to indicate the presence of lead.

Does EPA Recommend Test Kits For Paint, Dust, or Soil Testing?

No. EPA does not currently recommend test kits for testing for lead in paint, dust, or soil. Studies show the kits cannot reliably discriminate between high and low levels of lead. At this time, the kits are not recommended for testing performed by either homeowners or professionals.

If test kits are used, follow-up testing by a lead-based paint professional using EPA recognized methods is strongly recommended.

What About Testing For Lead In Water?

Lead pipes and lead solder were once used in plumbing, and lead leaked into drinking water. Water testing is not routinely conducted by lead-based paint testing professionals, but you may ask for it as an optional service. If you would like information about testing for lead in water, call the EPA Drinking Water Hotline at 1-800-426-4791.
What About Testing For Lead In Furniture, Dish Ware and Mini-Blinds?

Lead may be present in the paint on furniture. If the furniture is old or the paint is damaged, you may want to have it tested. An Inspector or Risk Assessor may do this testing for you.

Lead may also be present in some glassware (for example, lead crystal) and in glazes found on ceramic wares. The lead may be absorbed into the drink and food stored in these items. Contact the National Lead Information Center Clearinghouse at 1-800-424-LEAD or the Food and Drug Administration Food Information Line at 1-800-FDA-4010 for information on testing glassware and ceramics.

The Consumer Product Safety Commission (CPSC) has issued a warning that some mini-blinds may contain lead. For further information, contact the CPSC hotline at 1-800-638-2772.
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<tr>
<th>Topic</th>
<th>Agency</th>
<th>Contact Information</th>
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<tbody>
<tr>
<td>Testing ceramic ware and related items</td>
<td>Food and Drug Administration (FDA)</td>
<td>Phone: 1-800-FDA-4010</td>
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<td></td>
<td>Food Information Line</td>
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<tr>
<td>List of trained lead professionals</td>
<td>Lead Listing</td>
<td>Phone: 1-888-532-3547 Internet: <a href="http://www.leadlisting.org">www.leadlisting.org</a></td>
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<td>State lead programs and regulations; Current list of NLLAP laboratories; Lead brochures and fact sheets; General lead-based paint information</td>
<td>National Lead Information Center and Clearinghouse</td>
<td>Phone: 1-800-424-LEAD Or TDD-800-526-5456 (for the hearing impaired) Or Internet: <a href="http://www.epa.gov/lead/nlic.htm">www.epa.gov/lead/nlic.htm</a></td>
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<td>Select lead-related web sites</td>
<td>EPA</td>
<td>Internet: <a href="http://www.epa.gov/lead">www.epa.gov/lead</a> <a href="http://www.hud.gov/lead/leahome.html">www.hud.gov/lead/leahome.html</a></td>
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<td>HUD</td>
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<td>Information on testing drinking water for lead</td>
<td>EPA Drinking Water Hotline</td>
<td>1-800-426-4791</td>
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Additional Reading:

These brochures and fact sheets can be obtained by calling the National Lead Information Center Clearinghouse at 1-800-424-LEAD.


Protect Your Family From Lead In Your Home, EPA/CPSC brochure, EPA publication number EPA 747-K-94-001 (May 1995).


Identifying Lead Hazards In Your Home, EPA Fact Sheet, EPA publication number 747-F-96-007 (November 1996).


Disclosure of Lead-Based Paint Hazards in Housing, EPA/HUD Fact Sheet, EPA publication number EPA 747-F-96-002 (March 1996).

How To Check For Lead Hazards In Your Home, HUD/EPA/Consumer Federation of America brochure, (no date).