



LEAD-SAFE Remodeling

Dust-containment and meticulous cleanup are the keys to protecting workers, clients, and especially young children

by Tom O'Brien

As a restoration carpenter, old house owner, and parent, I've been concerned about lead paint for years. Intact lead paint generally poses no threat, either to workers or to the occupants of a home; but lead dust that's unleashed during remodeling activities can have serious consequences, especially for very young children. Fortunately, the precautionary measures that remodelers need to take are mostly common-sense, especially for anyone who already takes dust-control seriously.

Why Worry?

If it gets into the bloodstream, lead can unleash severe health problems — high blood pressure, anemia, kidney damage, memory loss, and impotence, among others — for adults. But lead is most harmful to children under the age of six because it interferes with brain development, which can have tragic, lifelong consequences. Lead is most easily absorbed into the bloodstream through the digestive system. Infants and toddlers are most at risk because they crawl on the floor and put



Figure 1. Sealing off this cold-air return duct ensures that job-site dust does not get blown throughout the house.

everything they touch in their mouths; pets can be lead-poisoned in the same manner. Workers who disturb lead paint need respiratory protection, especially when doing demolition or other high dust-generating activities, but they also must be especially careful to wash their hands before eating, drinking, or smoking.

All Painted Surfaces Are Suspect

Lead-based paint was officially outlawed for residential applications in 1978, but its use had steadily declined since 1950. So a house that was built between those years might have little or no lead, but one that was built before 1950 probably has plenty of it. Back in the day, lead-based paint was routinely applied to all of the wood surfaces (interior and exterior), but only some of the plaster. Plaster surfaces in kitchens and baths were routinely coated with a “scrubbable” glossy, lead-based paint. The plaster in closets oftentimes got a coat of lead (under the assumption that the long-lasting lead-based paint would enable these surfaces to be painted once and forgotten). Typically, the other plaster surfaces in a house were not covered with lead-based paint, but who knows what could have been done over the course of 50 or a hundred years?

Testing. The only way to know for sure where lead paint may be lurking is to test for it. This can be tricky, however, because so many years have passed since lead paint was the norm that the topmost paint layers are usually lead-free. If you use a do-it-yourself test kit, you must be sure to cut through every layer of every painted surface in

question or you’ll likely get a false negative result. A more accurate and less invasive option is to hire a certified lead inspector (at a cost of several hundred dollars) to test all the surfaces using an x-ray device that will detect the presence of lead no matter how deeply hidden.

Sally Odle, of Safe Homes Inc., a lead consulting firm in Waterbury, Conn., advises remodelers like me to save their money, assume that all of the painted surfaces have lead, and take the necessary precautions. “By working lead-safe, you’re going to create much less of a mess and your customer is going to be a lot happier,” she says.

Isolate the Work Area

If I’m beginning a remodeling project in which significant dust will be generated — by activities such as removing plaster, exposing wall cavities, or stripping paint — I try to completely isolate the work zone from the occupied area of the house. This practice not only guarantees that all of the mess is contained, but it also prevents inquisitive children from sneaking into the work space.

6-mil poly and duct tape. If I’m lucky, the containment process might be as simple as locking an interior door and duct-taping its edges, or covering an open passageway with 6-mil plastic sheeting and sealing all four sides with duct tape. For larger projects or houses with open floor plans, I may have to erect a temporary partition wall and wrap it with a membrane of 6-mil poly. (For more information about erecting an effective dust partition, see “Protecting the Job Site,” 4/04.)

If the house has a forced-air hvac system, I shut

Two-Layer Dust Door

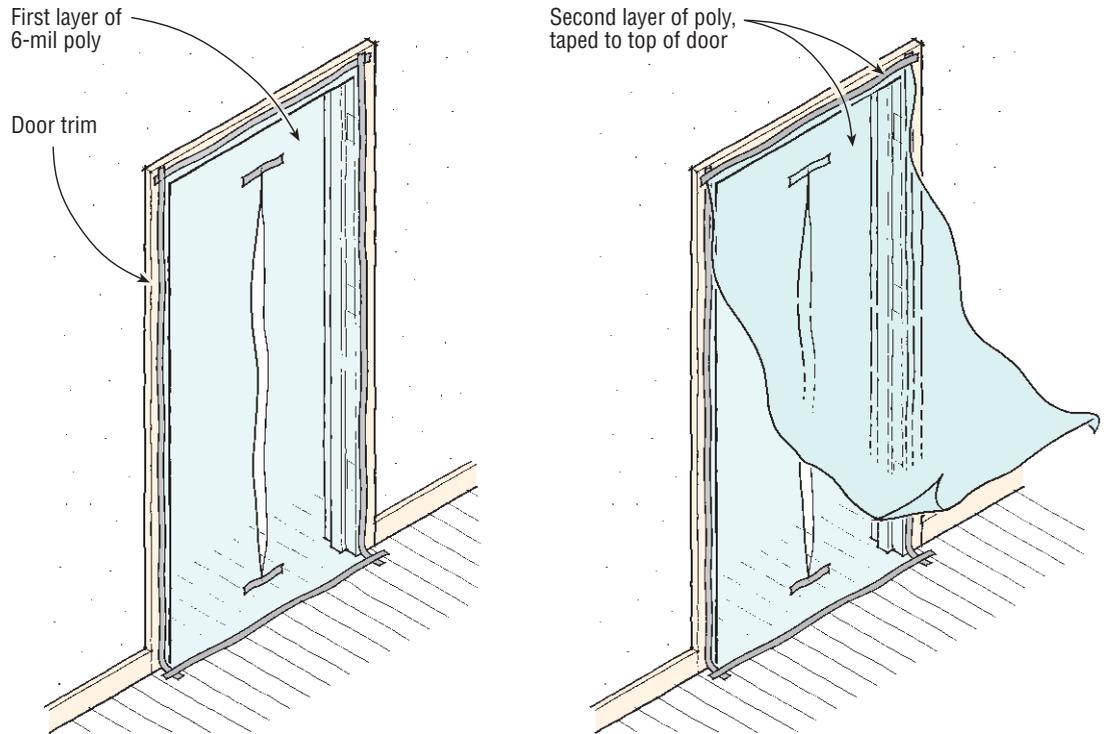


Figure 2. To make an effective airlock — one that lets people in without letting dust out — use two layers of 6-mil plastic. The first layer should be a few inches longer than the doorway and about a foot wider (so there's plenty of slack in the middle). After duct-taping all sides of the plastic, cut a slit down the middle, stopping 6 inches short of the top and bottom (reinforce the ends of the slit with duct tape). Place the second layer of plastic over the first one and tape it to the top of the door.

it down (if possible), and seal up the registers in the work area (especially the cold-air return) with plastic and duct tape (see Figure 1, previous page). To contain the worst of the debris, I cover the floor with a layer of 6-mil plastic and tape the edges to keep it from sliding.

In a perfect world, the barrier between occupied space and job site should remain intact until all of the dust-generating activities have been completed and the site has been thoroughly cleaned. During the dusty phase of the job, workers would access the site directly through an exterior door (or possibly a window); and they would use separate bathroom and hand-washing facilities.

However, forcing workers to climb in and out of a window is bad for morale (even with both sashes removed), so Dennis Livingston, a contractor and lead consultant from Baltimore, schedules his

remodeling projects to ensure that all of the dust-generating work gets done upfront; "Do all of your dirty work first," he says. "Then clean the place immaculately and you can treat the job like any other remodeling project." To be successful, a policy such as Livingston's requires cooperative subcontractors — plumbers and electricians who make sure that all of the holes they need to punch in the walls are done in advance, and painters who are willing to schedule an early visit to the job if their prep work will disturb lead paint.

To further compress this dirty phase of the job, painted items like doors, windows, and trim that need stripping or repair can be removed to an offsite shop or sent to a paint-stripping specialist. Messy repairs, such as planing doors and reglazing windows, can also be accomplished by setting up a temporary work space — securely walled-off by

plastic sheeting — in a garage or a basement. At the end of the job, this “dust room” would then be cleaned just as carefully as the work site.

Partial Isolation

On some jobs, I’ve found it impossible to completely isolate the work area from the residence. If workers have no choice but to pass through occupied territory to get to the job, lead consultants recommend covering the pathway with a plastic drop cloth that’s carefully folded (dirty side to dirty side) at the end of each day and routinely cleaned with a HEPA vacuum.

I’ve found plastic to be too slippery for pathways, so I break this rule by using a canvas drop cloth, but I’ve marked the top (dirty) side with a bunch of bright red Xs to ensure that the clean side always rests on the floor.

Doorways. In a case such as this, the entrance to the job could be through a swinging door that’s fully sealed on every side with some type of weatherstripping; but it’s also possible to fashion an effective airlock using duct tape and two sheets of 6-mil plastic (Figure 2, previous page). On the days when dust is flying, workers should always remove their protective garments or vacuum the dust off of their clothes and shoes before leaving the work space.

Worker Protection

Containing lead, as well as all of the other nasty stuff — asbestos, plaster, coal dust, dead bugs,



Figure 3. A half-face respirator with purple (HEPA) filter cartridges is standard equipment for workers who routinely disturb lead paint (the extra-thick purple and yellow cartridges offer additional protection from lead or chemical fumes). Remodelers, electricians, and other workers who don’t disturb lead very often can wear a comfortable N100 disposable respirator.



Figure 4. After the dirty work is done, all surfaces and crevices should be slowly and thoroughly vacuumed with a HEPA vac.

You Must Provide the Pamphlet

The federal government requires contractors who will be disturbing more than 2 square feet of lead paint to provide their clients with a government pamphlet that warns them about the dangers of lead. As proof of notification, the contractor must obtain a signature from the client that acknowledges they were given the pamphlet. Contractors who fail to comply with this simple rule may find themselves subject to a \$25,000 fine. Bulk copies of this pamphlet (*Protect Your Family From Lead in Your Home*) are available from the government printing office (202/512-1800; mention GPO stock #055-000-00507-9).

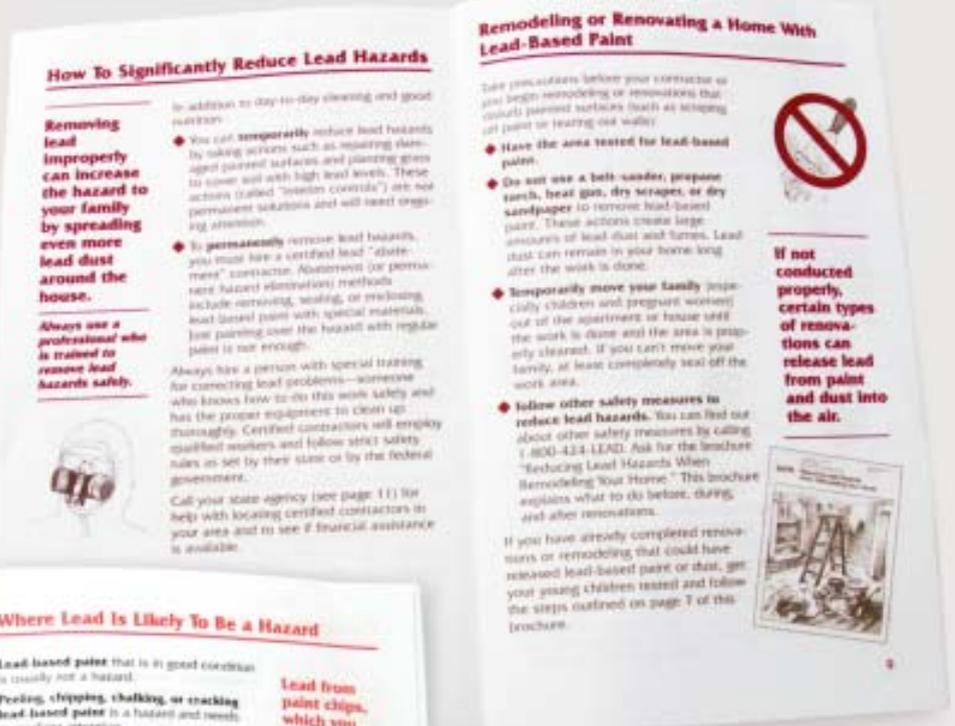




Figure 5. Swabbing a representative floor sample and sending it to a testing service (most can get you the results within 24 hours) is the way to know for sure that you've cleaned up all the lead.

animal droppings — that can get stirred up during an old-house remodel, is the best way to protect homeowners. But the best way to protect workers is to minimize the amount of dust that gets stirred up in the first place.

Working wet. The simple way to prevent dust is to spray a fine mist of water onto painted surfaces before scraping, sanding, or dismantling them. A 1-quart spray bottle is perfect for small-scale paint scraping or trim removal. A 1- or 2-gallon garden sprayer is a better choice for demolition or clean-up — misting debris before sweeping or shoveling is an extremely effective dust remedy.

Vacuum-attached power tools. Saws, grinders, planers, routers, and sanders specialize in kicking up dust. But fortunately, the best of these tools are now equipped for dust extraction. When attached to a high-efficiency tool-operated vacuum, the vast majority of the dust is contained at the source. "These days, everything I do attaches to a vac," says lead consultant Sally Odle.

Respiratory protection. By now, everyone knows that a cheap paper dust mask offers no protection from hazardous airborne dust. If you're a demolition specialist or a painter who's routinely exposed to lead dust, you need to wear a properly fitted, half-face respirator that's equipped with HEPA (purple) filters (Figure 3, page 4). If you remove paint using heat or chemicals, your respirator must be equipped with organic vapor filters (yellow) or with two-stage

filters (purple and yellow) that offer both types of protection.

Nobody likes to wear a respirator; and fortunately, most remodelers don't have to. If your work brings you into contact with lead dust on an occasional basis, all you need is an N100 series disposable respirator (3M Co.; 800/243-4630; www.3m.com). This nifty device meets the same HEPA filtration standards as a purple-filtered respirator, but it's much more comfortable. Although a single mask costs about \$8, it should last a worker for the duration of a typical job.

Facial hair. To provide effective protection from lead or other hazardous dust, a respirator must seal tightly against the face. A tight seal is not possible if the respirator is worn on top of facial hair. Although a full beard is unacceptable, a mustache or a tight goatee that fits inside the seal of the respirator is fine.

Clothing. Tyvek coveralls are another item that nobody wants any part of. They're hot and unflattering, but they can be convenient, especially when doing heavy demolition. Workers who don't wear Tyvek should change out of their lead-soiled clothing before entering their homes — or before driving home, if their children ever ride in their work vehicles. They should also wash their clothes separately from those of the rest of the family.

Clearing the air. Some remodeling contractors set up negative air machines that filter the air before exhausting it to the outside. There's noth-

ing wrong with using these devices; they do an excellent job of capturing lightweight dust such as asbestos and fiberglass, but they haven't proven very effective with lead, which tends to settle to the ground quickly. Other air-clearing devices, such as unfiltered squirrel cages or window-mounted fans should not be used, however, because they just pour the dust onto the lawn.

Cleanup

Experts tell me that vacuum cleaning may not suck up every bit of lead dust — especially if you've used water to control the dust — so the final clean-up requires washing as well as vacuuming. The standard procedure goes something like this: After carefully folding and discarding the plastic floor covering, slowly vacuum all horizontal surfaces using a HEPA or other high-filtration vac; pay particular attention to crevices and cracks between floorboards (Figure 4, page 4). Finally, you should scrub all of the horizontal surfaces with a strong household detergent and empty the dirty rinse water into a toilet, never a sink or bathtub.

Before the barriers come down, you can verify the effectiveness of your cleaning process by swabbing a section of the floor with a wet wipe and sending it to a testing lab (Figure 5, previous page). If your clients have young children and are worried about their exposure to lead, you might choose to have this testing done by a third party. (To locate a qualified lab or third-party testing service, visit www.leadlisting.org.)

Small Jobs

Fortunately, lead paint is not so big a threat that every job needs to be encased in a cocoon. The lead dust or paint chips that might be released when removing a window sash, taking out a door panel, or replacing a few pieces of trim can be contained by a plastic drop cloth that extends 5 feet out in every direction from the work surface (Figure 6). Any furniture or personal items within these boundaries should be moved or covered with lightweight plastic. The plastic floor cover can be reused, if you're moving from one place to another, as long as you fold it carefully (dirty side to dirty side) and unfold it just as carefully. It's a good practice to take off your shoes before you step off the plastic, or vacuum them clean.

Exterior Paint

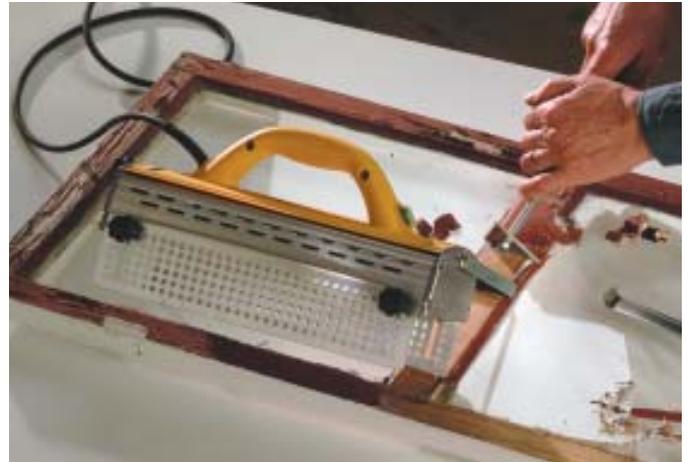
Unless you throw a tent over the whole house, it's not possible to fully contain the dust that's generated by paint preparation. So every activity



Figure 6. For a job that might disturb only a small amount of lead paint, you just need to cover the floor with a sheet of 6-mil plastic that extends 5 feet away from the work area. Plastic shoe covers keep dust off and improve traction on the slippery surface.



Figure 7. The Paint Shaver grinds off paint but captures almost all of it in an attached vacuum (left). The Silent Paint Remover uses low-level infra-red heat to loosen paint without releasing lead paint fumes (below).



must be planned to minimize dust generation. Power washers, if used at all, should only be used by a skilled operator to clean the painted surface, never to remove loose paint. Cover the ground and plants with 6-mil plastic that extends at least 10 feet out from the base of the house. On sunny days, use a gardening film such as Weed Block, which is less likely to burn plants.

Paint removal. Don't use unshrouded power tools, belt sanders, or torches to remove paint. I've had good luck using the Paint Shaver (American International Tool; 800/932-5872; www.paintshaver.com), a shrouded grinder that's attached to a tool-actuated vacuum (Figure 7). Recently I also started using the Silent Paint Remover (Viking Sales; 585/924-8070; www.silent-paintremover.com), which loosens paint using infra-red heat (see photo, page 1). Stripping paint takes longer with this device, but it's quieter and less grueling to operate. Respiratory protection should be worn when using either of these tools.

You could also use a chemical paint stripper such as Peel-Away (Dumond Chemicals; 800/245-1191; www.dumondchemicals.com), but you have to collect the rinse water and dispose of it properly.

Minor surface preparation. If most of the paint is intact, I remove the loose patches using a sharp carbide hand scraper. Then I feather the edges of the intact paint using a shrouded random-orbit sander that's attached to a tool-actuated vacuum. 

Tom O'Brien is a restoration carpenter and a freelance writer in New Milford, Conn.

Lead Resources

The National Paint and Coating Association (NPCA) is currently funding a number of free one-day courses across the country to train workers as well as homeowners on lead-safe work practices. To find a program in your area, visit NPCA's website at www.paint.org.

For more information about lead:

U.S. Department of Housing and Urban Development (HUD) Office of Healthy Homes and Lead Hazard Control

www.hud.gov/lead

National Lead Information Center

www.epa.gov/lead

To purchase lead-safe work supplies:

AramSCO

www.aramSCO.com