HOW-TO BOOKLET #3408

INDOOR POLLUTANTS

TOOL & MATERIAL CHECKLIST

- ❑ Asbestos Test Container
- ❑ Sealant
- ❑ Lead Paint Test Container
- ❑ Dehumidifier
- ❑ Protective Clothing
- ❑ Gypsum Board
- ❑ Duct Tape
- ❑ Air Cartridge Respirator
- ❑ Knife
- ❑ Gloves and Goggles
- ❑ Putty Knife
- ❑ Non-Lead Paint

Read This Entire How-To Booklet for Specific Tools and Materials Not Noted in the Basics Listed Above.

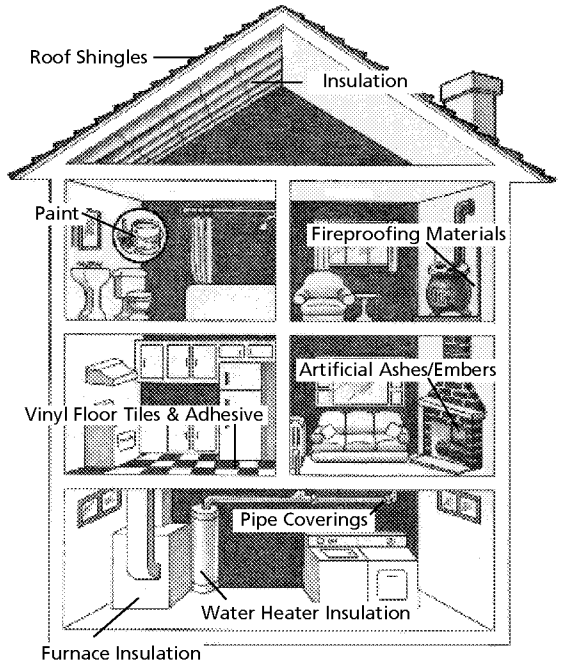


Fig. 1

Where asbestos hazards may be found.

Building products have introduced three of the worst indoor pollutants found in homes today. Dangerous indoor pollutants include asbestos, lead and formaldehyde.

ASBESTOS

In older homes, asbestos is most commonly found in hot water pipe coverings, furnace insulation materials, asbestos roof shingles, millboard, textured paints, vinyl floor tiles and tile adhesive, ceiling texturing and other ceiling coating materials. Asbestos has adverse effects on your health. Prolonged, heavy contact with asbestos may cause asbestosis, a malady similar to coal miners' black lung disease and lung cancer. Contact with asbestos may also cause severe skin, eye, and respiratory irritation much like the irritation caused by contact with fiberglass or mineral wool insulation.

Even if asbestos is in your home, it may not be a serious problem. The mere presence of asbestos in a home or a building is not hazardous. The danger is that asbestos materials may become damaged over time. Damaged asbestos products release asbestos fibers and become a health hazard. Therefore, the best thing to do with asbestos material in good condition is to leave it alone! Elevated concentrations of airborne asbestos in the home usually only occurs after asbestos-containing materials are disturbed by cutting, sanding, or other remodeling activities. Improper attempts to remove these materials can release asbestos fibers into the air in homes--increasing asbestos levels and endangering people living in those homes **(Fig. 1)**.

Identifying Asbestos. Unless clearly labeled, you can't tell whether a material contains asbestos simply by looking at it. If in doubt, treat the material as if it does contain asbestos, or have suspect materials analyzed by a private professional testing service. An alternative is to take a sample yourself for testing by an EPA-approved laboratory. To find an approved testing laboratory, contact your local EPA office. You will have to pay for the testing.

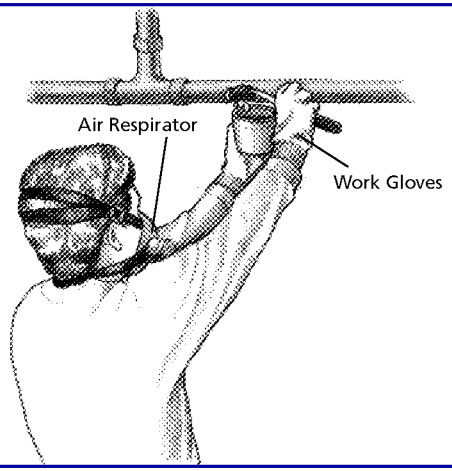
It's best to have a qualified professional take the sample and make the analysis. However, if you choose to take the sample yourself, it must be done with great care so you don't release any of the asbestos fibers into the air or onto yourself. Contact the testing laboratory for specific procedures. They will supply a sealable container for your test sample. Mist the material first with water from a sprayer to minimize fiber release. Wear protective clothing and use a cartridge-type air respirator while taking the sample **(Fig. 2)**. Carefully cut a piece from the entire depth of the suspected material and place it into a container furnished by the testing lab. Tightly seal the container and send it to the laboratory. Usually you will get the results within 7 to 10 days. Carefully clean up any material around the area sampled; then patch the area with duct tape to prevent fibers from being released.

As mentioned earlier, if the asbestos materials are in good shape and won't be disturbed, do nothing. If the tests reveal a possible problem there are two types of repairs.

Sealing Asbestos. Sealing (encapsulation) involves treating the material with a sealant that either binds the asbestos fibers together or coats the material so fibers are not released. Pipe, furnace, and boiler insulation can sometimes be repaired this way. This should be done only by a professional trained to handle asbestos safely.

Fig. 2

Taking an asbestos sample.



Covering Asbestos. Covering (enclosure) involves placing something over or around the asbestos material to prevent the release of fibers. Exposed insulated piping may be covered with a protective wrap or jacket. When doing so, wet down with a spray of water, then wrap the piping with duct tape. If an old jacket is in very bad shape, cover it with a larger jacket of a non-asbestos material.

With any type of repair, the asbestos remains in place. Repair is usually cheaper than removal, but it may make later removal of asbestos, if necessary, more difficult and costly. Removal of asbestos should always be done by professionals.

LEAD

Lead poisoning is particularly dangerous for children but is also harmful to adults. In children, lead poisoning can cause irreversible brain damage and can impair mental functioning. It can retard mental and physical development and reduce attention span. In pregnant women, lead exposure can stunt fetal development even at extremely low levels. In adults, it can cause irritability, poor muscle coordination, and nerve damage to the sense organs and nerves controlling the body. Lead poisoning may also increase blood pressure. Clearly, young children and infants, fetuses, and adults with high blood pressure are the most vulnerable to the effects of lead.

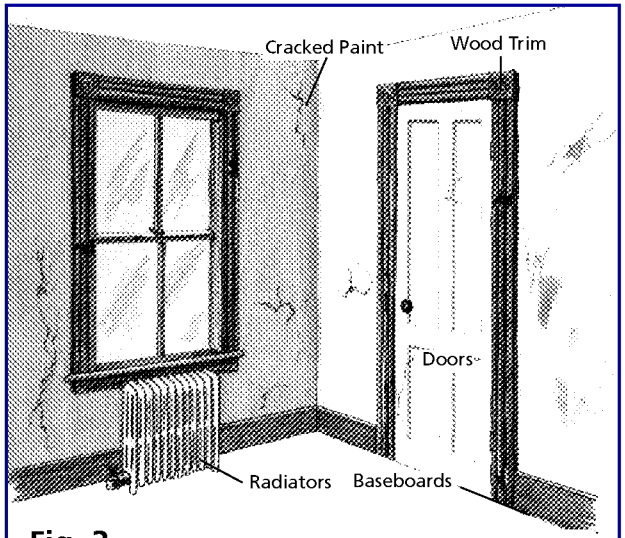


Fig. 3

Lead-based paint may be anywhere. Check all wood trim, radiators, and cracked or chipped surfaces.

Lead-based paint is a major source of lead poisoning. Lead was used as a pigment and drying agent in "alkyd" oil-based paint. Introduced more recently, latex water-based paints generally do not contain lead. All types and brands of modern paint are lead-free. About two-thirds of the homes built before 1960 contain heavily-leaded paint. Some homes built after 1960 also contain heavily-leaded paint.

Lead paint may be on any interior or exterior surface, but particularly on woodwork, doors, and windows. In 1978, the Consumer Product Safety Commission (CPSC) lowered the legal maximum lead content in most kinds of paint to 0.06 percent (a trace amount). If your home was built before 1980 consider having your paint tested for lead before renovating, or if the paint (or underlying surface) is deteriorating **(Fig. 3)**.

Identifying Lead Paint. The method of testing for lead-based paint in the home is basically the same as those for asbestos: Have it done by a professional or send a sample to an EPA-approved laboratory. To do the latter, use a sharp knife to cut through the edges of the sample paint. The lab will tell you the size of the sample needed. It will probably be about 2 inches by 2 inches square. Lift off the paint with a clean putty knife and put it into the container furnished by the test lab. Be sure to take a sample of all layers of paint, since only the lower layers may contain lead. Don't include any of the underlying wood, plaster, metal, or brick **(Fig. 4)**.

Label the container with your name and the location in the house from which each paint sample was taken. Several samples should be taken from each affected room. Results and recommendations of the test will be received in 7 to 10 days.

There are several do-it-yourself kits available at paint stores and home centers. The interpretation of the results from these lead test kits depends on the test solution used. Follow the kit's instructions to determine the results of the test.

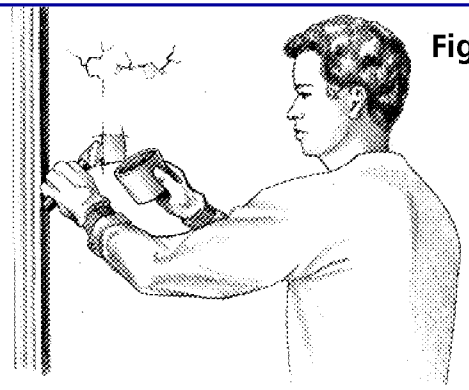


Fig. 4

Removing sample lead chip.

There are problems with home test kits. Most of them do not register low levels, so they can give a false negative. Metals in the paint may cause false positive results. Resins in the paint may prevent the test agent from changing the paint chip color. Problems such as these may cause kits to not correctly detect the presence of lead. A sure testing is to have it done by a professional using an electronic lead instrument tester.

Removing Lead-Based Paint. If tests show that lead paint is present, you can:

- Replace the painted item. Replace a door, molding, or other easily removed item only if you can do it without creating lead dust. Items that are difficult to remove should be replaced by professionals who will control and contain lead dust.
- Cover the lead-based paint. You can spray the surface with a sealant or cover it with drywall sheets. However, painting over lead-based paint with non-lead paint isn't a long-term solution. Even though the lead-based paint may be covered by non-lead paint, the lead-based paint will continue to loosen from the surface below and create lead dust and chips. The new paint may also partially mix with the lead-based paint and lead dust will be released when the new paint begins to deteriorate.
- Remove the lead-based paint. Have professionals trained in removing lead-based paint do this work. Each of the paint-removal methods (sanding, scraping, chemical removal, sandblasting, or heat stripping) can produce lead fumes or dust. Fumes or dust can become airborne and be inhaled or ingested. Wet methods help reduce the amount of lead dust. Removing moldings, trim, window sills, and other painted surfaces for professional paint stripping outside the home may also create dust. Be sure the professionals contain the lead dust.

You can remove a small amount of lead-based paint if you can avoid creating any dust. Make sure the surface is less than about one square foot (such as a window sill). Any job larger than about one square foot should be done by professionals. Make sure you can use a wet method such as a liquid paint stripper.

Identifying Other Lead Sources. Lead-based paint may not be the only source of lead in your home. As described in How-To Booklet #3404, "Water Quality", lead may be present in the water you drink if your plumbing system contains lead pipes or lead solder connections. Lead levels in water may also rise if your municipality is conducting work on lead piping.

FORMALDEHYDE

Formaldehyde is an important chemical used widely by industry to manufacture building materials and numerous household products. It's also a by-product of combustion and other natural processes. Formaldehyde may be present in substantial concentrations both indoors and outdoors.

Sources of formaldehyde in the home include smoking, household products, and the use of unvented, fuel-burning appliances, such as gas stoves or kerosene space heaters. Formaldehyde, by itself or in combination with other chemicals, serves a number of purposes in manufactured products. For example, it's used to add permanent press qualities to clothing and draperies, as a component of glues and adhesives, and as a preservative in some paints and coating products.

Most people notice the strong, pungent odor of formaldehyde in the air at about 1 ppm (part per million). Some people can smell concentrations that are much lower. Noticeable health effects are watery eyes and chronic respiratory problems among family members, especially during the winter months when the home is sealed. High concentrations may trigger attacks in asthmatics. There is some evidence that people can develop chemical sensitivity after exposure to formaldehyde. Formaldehyde has also been shown to cause cancer in animals and may cause cancer in humans **(Fig. 5)**.

Identifying Formaldehyde Sources. Along with some carpets, the most significant sources of formaldehyde are likely to be pressed wood products made using adhesives that contain urea-formaldehyde (UF) resins. Pressed-wood products made for indoor use include:

- Particleboard used as subflooring, shelving, cabinetry, and furniture.
- Hardwood plywood paneling used for decorative wall covering and for cabinets and furniture

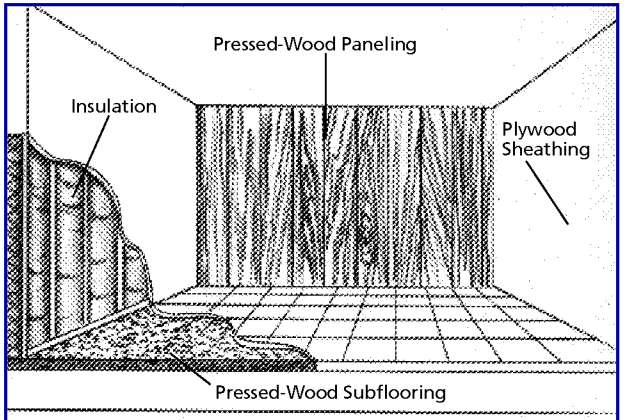


Fig. 5 Sources of formaldehyde.

- Medium density fiberboard used for drawer fronts, cabinet doors, furniture tops, and closet shelving.

Medium density fiberboard contains a higher resin-to-wood ratio than any other UF pressed-wood product, and is generally recognized as being the highest formaldehyde-emitting pressed-wood product.

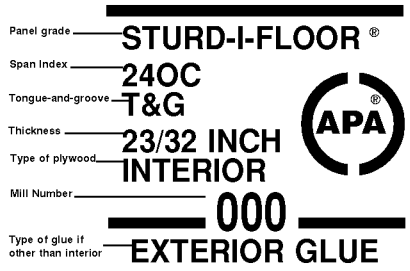
Other pressed-wood products, like softwood plywood and flake or oriented strandboard, are produced for exterior construction use and contain the dark-, or reddish-black colored phenol-formaldehyde (PF) resin. Although formaldehyde is present in both types of resins, pressed-woods that contain PF resin generally emit formaldehyde at considerably lower rates than those containing UF resin. To find out what kind of formaldehyde is in a product, contact the manufacturer and request a technical data sheet.

Formaldehyde Emission. Formaldehyde emissions will decrease as products age. When the products are new there are elevated levels of emission that are increased by high indoor humidity and temperature.

Certain environments and structures are particularly susceptible to formaldehyde emissions. Since 1985, the Department of Housing and Urban Development (HUD) has permitted only plywood and particleboard that conforms to specified formaldehyde emission limits for the construction of prefabricated and mobile homes. In the past, some of these homes had elevated levels of formaldehyde because of their large amount of high-emitting pressed-wood products used in their construction and because of their relatively small interior space. However, many people are still bothered by the lower emitting products.

During the 1970s many homeowners had urea-formaldehyde foam insulation (UFFI) installed in the wall cavities of their homes as an energy conservation measure. However, many of these homes

Fig. 6



Interior grade of plywood using exterior type glue.

were found to have high indoor concentrations of formaldehyde soon after the UFFI installation. Homeowners rapidly became sick and spurred an increased awareness of formaldehyde dangers. Few, if any, homes are now being insulated with this product. Studies show that formaldehyde emissions from UFFI decline with time; therefore, homes in which UFFI was installed many years ago are unlikely to have high levels of formaldehyde now unless the insulation is damp and there are cracks or openings in interior walls that expose the foam.

Reducing Formaldehyde Exposure. If you suspect a problem, the first step should be to consult your family physician or allergist to confirm a sensitivity to formaldehyde. If confirmed, tests can be run to determine the source and concentration of the formaldehyde in your home. If you experience adverse reactions to formaldehyde, avoid the use of pressed-wood products and other formaldehyde-emitting goods. Even if you don't experience such reactions, you may wish to reduce your exposure as much as possible by purchasing exterior-grade plywood products, which emit less formaldehyde **(Fig. 6)**.

Some studies suggest that coating pressed-wood products with polyurethane may reduce formaldehyde emissions for some period of time. To be effective, any such coating must cover all surfaces and edges and remain intact. Increase the ventilation and carefully follow the manufacturer's instructions while applying these coatings. If you're sensitive to formaldehyde, before purchasing coating products check the label contents to avoid buying formaldehyde-containing products (they'll emit the chemical for a while after application). Remember too, that glues and binders slowly release formaldehyde into the air around them. With time, these emissions should decrease substantially.

In areas of the home where possible formaldehyde products may be, maintain moderate temperature and humidity levels and provide adequate ventilation. The rate at which formaldehyde is released is accelerated by heat humidity. To achieve the lower rate of release, dehumidifiers and air conditioning can control humidity and maintain a moderate temperature to help reduce formaldehyde emissions. Increasing the rate of ventilation in your home will help in reduce formaldehyde levels.

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