

Carson Dunlop Reports

Supplementary Reference Guide

1.0. ASBESTOS

Description

Asbestos is a fibrous material that was used in many building materials as an acoustic insulator, a fire resistant material, a binder, and a thermal insulator. It can be found residentially in pipe and duct insulation on heating systems, in sealers on heating boilers, in roofing products, siding, stucco, plaster, drywall compound (spackle), panelling, ceiling tiles, floor tiles and sheet goods, wall and attic insulation, and in asbestos-cement (Transite) pipe. This list is by no means complete.

The Concern

The very small asbestos fibers can cause cancer and other types of lung disease if inhaled. The fibers are so small and light that if released into the air, they may float for several days. They are not collected by furnace filters or conventional vacuum cleaners.

Asbestos is considered dangerous only when “friable”. This means that the material containing asbestos is broken, has ragged edges, or is otherwise in a state where the fibers may be released into the air. In most building products, asbestos isn’t normally friable. However, demolition or renovation work can disturb asbestos containing materials, causing the asbestos fibers to be released into the air.

Identification

Asbestos can only be identified by laboratory analysis. Therefore its identification is beyond the scope of a home inspection. The vast majority of homes contain some asbestos. As discussed, this is not a problem unless it is friable. There are firms in most centers that specialize in identification of asbestos, and in taking corrective action where necessary.

What Can Be Done

In the majority of cases, doing nothing is the best approach. Where there is a risk of fibers being released into the air, the asbestos containing material can be isolated from the rest of the house through enclosure or encapsulation. Alternatively, the material can be removed. The latter is the most expensive of course, since care must be taken not to release fibers into the home, and because disposal of asbestos containing materials is controlled in many areas.

Home Improvement Costs

Since most home improvements involve some demolition, additional costs may be incurred where asbestos containing materials are suspected. This would apply to such things as boiler replacement, re-roofing, re-siding, flooring replacement, and gutting of interiors, for example.

Not for the Do-it-your-selfer

Corrective actions related to asbestos should not be undertaken by the home-owner, as a general

rule. Guidance is available from the Environmental Protection Agency in the U.S. and from Provincial Ministries of Labour, Occupational Health and Safety Division in Canada.

2.0 RADON

Description

Radon is an invisible, odorless, tasteless gas that occurs naturally in the earth's crust. Radon is a product of the decay of uranium. The decay of uranium to lead is a fourteen step process. Radon is formed at the sixth step. It is unique because it is the first decay product which is a gas, not a solid.

The Concern

The radon gas itself is not a problem but its decay products are. The radioactive decay products are particles which can attach themselves to lung tissue when radon gas is inhaled. It is primarily the alpha radiation that causes lung cancer. In the United States, it is estimated that up to 20,000 deaths every year are caused by radon gas. As with cigarette smoking, the risk is higher with greater exposure. The effects are long term rather than immediate.

Where it is Found

Uranium is present in many parts of the earth's crust. Areas subject to high radon gas levels have appreciable concentrations of uranium in the earth and cracks or porous soils through which the gas can migrate up to the surface.

How it Gets Into Houses

Radon which escapes into the air is not a problem, since it is diluted quickly. In buildings, however, radon gas can be trapped, particularly during winter months when doors and windows are kept closed and ventilation is at a minimum. It is difficult to predict which buildings will have a problem.

Radon enters the building through cracks in basement floors and walls, openings around pipes and electrical services into the basement, through water supplies, and through basement floor drains, for example. Even in areas with high concentrations in the earth, one building may have very high radon levels and a similar building across the street, very low levels.

Testing

There are several types of detectors available for testing radon levels in buildings. A charcoal canister can be used to absorb radon from the air. There are etch detectors which use a sensitive plastic surface. The radon will leave tracks or etchings on the plastic, which can be measured. There are filtering systems wherein air is pumped through a filter. There are also grab-sample testers which allow for short term testing by simply taking an air sample. The identification of radon gas in a home is not part of an ASHI home inspection.

Most of the test procedures require laboratory analysis. The amount of time needed for accurate results is a point of disagreement among experts. The levels of radon gas which require action are also controversial. In the U.S., any levels above 4 Picocuries/liter bring a recommendation. In Canada, the action level is 20 Picocuries/liter. Since radon levels in a building can vary at different times in the day and seasons of the year, longer testing times are better. Winter testing is

generally considered more reliable than summer testing.

There are several techniques used to lower radon levels in houses. They include sealing holes to prevent radon gas getting into houses, pressurizing basements or crawl spaces to keep the gas out, and adding pipes below basements to carry radon away from the home. Methods will probably change greatly over the next few years. Assistance is available from the Environmental Protection Agency in the U.S. and from Health and Welfare Canada, Environmental Radiation Hazards Division, in Ottawa, Canada.

3.0 UREA FORMALDEHYDE FOAM INSULATION

Description

Urea formaldehyde foam insulation (UFFI) became popular as a residential retrofit insulation in the mid-1970's. UFFI was banned in Canada in December 1980, because of the suspected health hazards. In the United States it was banned in 1982, then the ban was lifted. It is not widely used any more.

Colors and textures of UFFI are variable; however, it can be distinguished from other insulating foams by its frail, crumbly structure and powdery residue. Positive identification can only be made through laboratory testing.

Because UFFI is a highly expandable foam, it was used to insulate hard to reach areas. Holes were typically drilled in exterior walls and the material injected from the outside. Although it is sometimes possible to see plugged application holes on the exterior, a new siding material, ivy, or even paint can easily hide any evidence of application. Occasionally, it was injected from inside the building, in which case its application is often disguised by interior finishes.

Inspection

Some specialists look for UFFI by drilling holes in wall cavities and performing air quality testing. This is not always conclusive. In the opinion of many, only with the removal of all interior finishes is it possible to say that there is no foam in the building. For this reason, the identification of UFFI is beyond the scope of a home inspection performed to ASHI standards.

The Consumer Product Safety Commission (1-800-638-CPSC) can provide additional information in the U.S. A UFFI information booklet can be obtained by contacting Industry Canada at 1-613-954-2754.

4.0 LEAD

Description

Lead is an element which occurs naturally in the soil. Soil also collects lead from the air and other sources.

In Water

Lead is also a natural constituent of surface and ground waters which supply drinking water.

Lead pipe was used in many houses up to the 1950's as the main water service line from the street. Lead was also a component of solder for copper pipes, but was banned in the 1980's. To a lesser extent, lead can also be found in some plumbing fixtures.

Although initially there may be relatively high concentrations of lead in supply piping containing lead solder or in lead service lines, over the years, a build-up of lead oxide on the inside pipe surface reduces extreme contamination. In December 1992, the U.S. EPA (Environmental Protection Agency) action level for lead in drinking water was changed to 15 parts per billion from a first draw off a fixture. As a precautionary measure, residents can run the plumbing fixtures for two to three minutes before drinking the water in order to clear out water which was in contact with the pipes for a long period of time.

In Canada, the action level is currently 10 parts per billion, but from a fully flushed fixture. Therefore, in older houses which may have lead in the plumbing pipes, flushing the pipes, if the water was at rest for more than 5 to 8 hours, may be desirable. Hot tap water should not be used for drinking or cooking because hot water leaches lead from the pipes or solder joints.

In Paint

For the typical homeowner, the highest risk of exposure to lead would be from paint. Lead was used extensively for pigmentation and as a drying agent in oil based paints until the early 1950's. Except for a small number of cases, lead was never added to latex paints. Most manufacturers used other substances for pigmentation after the early 1950's; however, lead was still used as a drying agent. Exterior paints contained the highest levels: up to 60 or 70 percent lead by weight.

It wasn't until the mid 1970's that the Canadian government set a limit of 5,000 parts per million of lead for interior paints. No limit was set on exterior paints. Currently, the majority of paints on the market conform to U.S. standards which do not allow lead to be added. The U.S. government banned indoor leaded paint in the 1970's.

The Concern

Young children, especially those under the age of four, often play on the floor, and tend to put their hands, which may collect lead particles, in their mouths. Children tend to absorb lead more easily than adults because their metabolism is faster. Children are particularly vulnerable up to the age of six. Lead affects the child's nervous system by slowing development. These effects may be irreversible and include hearing impairment, behavioral problems and a lessening of intelligence.

The signs of lead poisoning are difficult to distinguish from normal child-like complaints and sometimes, children show no symptoms at all. When they do, the symptoms can be flu-like: stomach cramps, irritability, loss of appetite and general fatigue. Since these symptoms are so general, it's best not to rely solely on them as indicators of lead.

Pregnant women should not be exposed to lead, as it can interfere with the proper development of the fetus. For other adults, short term exposure to lead may cause temporary illness (upset stomach, headaches, et cetera), but the effects are not permanent. However, long term or acute exposure can cause serious health problems for adults, such as permanent kidney, nerve, hearing

and vision damage.

Lead Detection

The rough rule of thumb is if the house was built before 1980, there could be some lead paint on the interior or exterior of the house. If the house was built before 1950, it almost certainly will. In order to verify whether or not lead-based paint is present in the house, relatively inexpensive (typically less than \$40) testing kits are available. These testing kits are typically capable of testing 50 or more samples. The testing kits will tell you if lead is present at significant levels; however, they will not tell you the exact amount of lead in the sample. The testing for lead paint in the house should only be undertaken if the rehabilitation work is to include the removal of paint, or if considerable amounts of peeling and flaking paint are noted in an older home.

Strategies for Removal of Lead Paint

All methods of removing lead paint can be dangerous. This includes heat strip-ping, sanding, scraping and the use of chemical strippers. Anytime you remove lead paint, there is a risk of creating lead dust. The finer the lead dust, the more easily it is absorbed into your system. Therefore, removal of lead paint is not a job for the homeowner. Hiring a contractor to do the work is strongly recommended. As part of that work, the contractor should ensure:

1. The family members are protected from lead dust during the removal process.
2. The family members' belongings are protected so they are not contaminated with lead dust.
3. The contractor should conduct a thorough clean-up following the renovations. This clean-up should include vacuuming with a high efficiency particle accumulator (hepa vacuum).

Encapsulation

If the condition of the interior plaster or drywall is poor, covering or enclosing the lead paint can be considered. This involves covering the original surfaces with drywall, heavy wallpaper (such as vinyl) or panelling. Liquid epoxy encapsulants that can be painted over lead paint are currently being developed. If the existing surface is in good shape, then repainting with a lead-free paint can be considered. However, some modern paints may not adhere well to old lead-based paints without wall preparation. If the surface is one that may be chewed by children (lead tastes sweet), repainting may not be sufficient.

5.0 CARBON MONOXIDE

Description

Carbon monoxide is a colorless, odorless gas. It is a by-product of combustion. (It is actually a by-product of incomplete combustion, but combustion is rarely complete.)

The Concern

When you inhale carbon monoxide, it gets absorbed into your body the same way that oxygen does. It replaces the oxygen on the hemoglobin in your blood which deprives your body of oxygen. The result is an increased heart rate as your heart tries to get more oxygen to your brain and other vital organs. The symptoms of long term exposure to low concentrations are slight

headaches, fatigue and shortness of breath with only moderate exertion. Continued exposure or high concentrations can result in severe headaches, breathing difficulties, dizziness, confusion, cardiac trauma, brain damage and ultimately, death.

Action

If you sense any of the above symptoms, move immediately to fresh air. Unconscious victims should be moved outdoors. Call for medical assistance and until it arrives, keep those exposed lying down and keep them warm by wrapping them in blankets. Rest is absolutely necessary. Under no circumstances should those exposed be allowed to walk for several hours after regaining consciousness. If breathing has ceased, artificial respiration should be undertaken immediately.

Risk Reduction

To help reduce the risk of exposure to carbon monoxide, fuel burning appliances should be inspected annually by a qualified technician. Gas burning equipment which is out of adjustment often has a flickering yellow flame as opposed to a steady blue flame. If you see this, call a qualified service person. One of the major causes of carbon monoxide build up in the home is poor draft from fuel burning appliances. This means that the products of combustion are not being safely carried outside and are backing up into the house.

A simple test such as holding a match to the edge of the draft hood on a water heater or a furnace will give an indication of draft. It is common for some products of combustion to leak out into the basement when a piece of equipment starts, however after it is running good draft should be established and a lit match will be drawn into the exhaust as opposed to being blown downwards or out into the room.

When products of combustion cannot escape properly from the house there tends to be a build up of moisture within the exhaust flue and ultimately within the house itself. Look for rusting on flue pipes and water leaking from the base of the chimney. Look for moisture condensing on windows and in extreme cases, on walls particularly near the furnace.

Detection

In addition to having your fuel burning appliances inspected once a year, carbon monoxide detectors can be installed on or near the ceiling in each room where there is a fuel burning appliance. In addition, CO detectors can be installed near sleeping areas. Much like smoke detectors, carbon monoxide detectors can be wired directly into the home's electrical system or they can be battery operated. Also, like smoke detectors, battery operated units should be tested weekly while hard wired systems should be tested monthly. If a CO detector does go off, immediately open doors and windows to ventilate the house. Call the fire department and evacuate everyone from the house. Remember that because carbon monoxide is colorless and odorless, never ignore an alarm even if you feel no adverse symptoms.