Asbestos In Popcorn Ceilings

by Leon A. Frechette

If you are thinking about removing a popcorn ceiling—STOP! The application of sprayed-on asbestos-containing coatings was banned in 1978, but a lot of popcorn ceilings installed as late as 1986 contained asbestos in the mixture. It's possible that your ceiling contains an asbestos level of 3 to 8 percent, so before you remove your popcorn ceiling, read this article to better understand what asbestos is and how its improper handling can affect your health. I've been in the construction field for over 25 years and I wish I'd known then what I know now about asbestos. I would not have tackled a lot of projects because of the asbestos content of certain building products.

What is Asbestos?

Asbestos is a fibrous mineral that is mined in the same way as copper, iron, and lead. It's a compound of silicon, oxygen, hydrogen, and various metal cations (positively charged metal ions). There are many varieties of asbestos; the three most common are chrysotile, amosite, and crocidolite. Chrysotile was first commercially mined in the 1870s in Quebec, Canada. Amosite was first mined in South Africa in 1916, and crocidolite asbestos also came from Africa beginning in the 1980s.

Asbestos is both durable and fire retardant. It became a popular commercial product to manufacturers and builders from the early 1900s to the 1970s because it resists corrosion and insulates well. It has been estimated that 3,000 different types of commercial products contain some amount of asbestos (from as little as 1 percent to as much as 100 percent). Asbestos can be found in many items from paper products and brake linings to floor tiles and thermal insulation. The list includes such products as fire retardant sheeting (gray asbestos paper), cement asbestos board, loose blown-in and batt insulation (1930 – 1950), sheet vinyl flooring (including the backing or underlayment), vinyl tile and vinyl adhesive, insulation blankets (the outside covering or shell for steam and hot water pipes), door gaskets, duct insulation and tape at duct connections of furnaces and boilers, sprayed- or troweled-on surface material for walls and ceilings, spackle, joint compounds, textured paints, vinyl wallpaper, roofing felts, roof felt shingles, roofing shingles, roofing tiles, and siding, just to name a few.

Unlike most minerals which turn into dust particles when crushed, asbestos breaks up into fine fibers too small to be seen by the naked eye. Since an average human hair is approximately 1200 times thicker than an asbestos fiber, it takes an extremely powerful microscope to see the fibers. Asbestos fibers are commonly mixed with other materials which binds them together so they can be used in many different building products. If these light hard-to-see fibers are released from an asbestos containing material (ACM), they will remain in the air for hours.

Intact and undisturbed, ACMs (popcorn ceilings, for example) don't pose a health risk. Asbestos only becomes a problem when the material containing asbestos is damaged, disturbed, or deteriorated and its fibers become airborne.

Serious health problems can result from exposure to asbestos fibers, depending on the length of exposure. Breathing high levels of these tiny fibers can impair normal lung functions and increase the risk of developing lung cancer, mesothelioma (cancer of the lung lining), or asbestosis. Symptoms of these diseases do not usually appear until about 20 to 30 years after the first exposure to asbestos. Studies show that the risk of lung cancer from inhaling asbestos fibers is also greater if you smoke, and individuals who get asbestosis have usually been exposed to high levels of asbestos for long periods of time, e.g., exposure in factories and shipyards.

Learn More About Asbestos

The U.S. Environmental Protection Agency offers some excellent detailed information that answers

frequently asked questions about asbestos and provides information to help the homeowner make informed decisions about its care and maintenance. Visit www.epa.gov/asbestos/ashome.html and check out the information under the following subtitles:

- What Is Asbestos?
- How Can Asbestos Affect My Health?
- Where Can I Find Asbestos And When Can It Be A Problem?
- What Should Be Done About Asbestos In The Home?
- Asbestos Professionals: Who Are They And What Can They Do?
- For More Information

Because most states run their own asbestos programs, your home state is generally the best place to start with questions about the requirements/ regulations that may apply to any given asbestos situation. However, the EPA Regional and State Asbestos Contacts can be found at http://www.epa.gov/asbestos/regioncontact.html as a starting point.

Obtaining a Sample For Testing

It is difficult to determine the presence of asbestos in a product with a visual inspection.

Until reliable independent laboratory analysis proves otherwise, it is important to treat building materials as though they contain asbestos. You can find a laboratory in the yellow pages of your phone book under "Laboratories-Analytical" or "Asbestos Consulting & Testing." The cost of a test is approximately $25 to $35 per sample. Call the laboratory to find out what size sample is required and the costs involved.

To obtain a sample (normally 1 square inch) for a testing lab, follow these simple instructions:

- Make sure that any heating or cooling system is turned off to minimize the spread of any released fibers.
- Fill a spray bottle with water mixed with few drops of liquid detergent. The water/detergent mist will help reduce the possibility of releasing asbestos fibers.
- Spray small areas of the ceiling in two or three places and allow the water/detergent mixture to soak in.
- Wearing gloves, use a 1-inch putty knife to carefully scrape a square inch of popcorn from each area into a resealable bag (consider putting each sample in its own container) and label each with some type of identification.
- Finally, take or send the sample(s) to a local asbestos testing lab.

I can't stress enough how important it is to treat your popcorn ceiling as though it contains asbestos until analysis by an independent laboratory proves otherwise. Don't get the notion that today you are going to scrape the popcorn off the ceiling. Stop and think about the consequences before you begin. This individual is ready to dive into a project but is not wearing protective clothing or gloves. Even taking a small sample requires protective measures!

Note: After sealing your sample(s), use a damp paper towel to clean up any deposits on the outside of the container.

If the laboratory results reveal that less than 1 percent asbestos is found in the sample, you may want to repeat the tests or send another sample to a different laboratory for a separate analysis. If the tests reveal the presence of asbestos, no matter how small the percentage, carefully consider whether you want to leave the asbestos-containing popcorn in place, encase the asbestos, or remove it altogether.

If you decide to encase or remove the asbestos, then you must carefully follow the correct and legally specified asbestos abatement procedures as you proceed with your project.

Removal is often not the best course of action to reduce asbestos exposure but it offers other benefits. Asbestos removal will allow you to creatively finish the ceiling without the worry of disturbing asbestos fibers, and any future work can then be done without worrying about asbestos. Additionally, proper removal of the asbestos ceiling will enhance the value of your home.

Popcorn Ceiling With Asbestos

Popcorn ceilings, whether residential or commercial, that have been determined to contain asbestos may require a state-certified professional asbestos contractor for removal. Contact the EPA, the State Environmental Protection Agency, your state's Labor and Industries office, and the air quality governing body in your area to learn their requirements. Be sure to speak with your local building department as they may also require permits.

A good place to begin is to go to www.epa .gov and click on "**Where You Live**" on their tool bar. Once you reach this page, click on the links to *EPA Regional Offices*. Each EPA Regional Office is responsible for the execution of the Agency's programs within its region. Select a region by clicking within the area of the map covered by the region, use the links located below the map to go directly to a region, or click on *State Environmental Agencies*. Links to some local government environmental offices are also included.

To locate a certified asbestos contractor, turn to your yellow pages under the heading "Asbestos Abatement."

However, if you are interested in pursuing the idea of removing a popcorn ceiling containing asbestos, I recommend that you visit the Puget Sound Clean Air Agency at www.pscleanair.org. Once there, click on "**Asbestos & Demolition**" on their tool bar and then "**Homeowners**." Here you'll find more information on the subject of asbestos. They also offer a PDF document titled: **How to Properly Remove Spray-on "Popcorn" Ceilings: From Owner-Occupied, Single-Family Residences Only**. This 20-page document can be found at www.pscleanair.org/forms/asb-popcorn.pdf and it gives instructions on the proper way to remove a popcorn ceiling with asbestos. If after reading this manual you choose to do the work yourself, it's critical that you follow each step completely and carefully—from site preparation to disposal—so that the removal project is effective, safe, and legal.

Other Options for Dealing with Asbestos

The following two options will encase the asbestos —and are less expensive and much easier than removing it. Be sure to wear an approved respirator (half-face, dual-cartridge, each equipped with purple color-coded P-, N-, or R-100 [HEPA] filters), disposable clothing, eye protection, and gloves before starting either of these two projects.

1. **Install furring strips over existing ceilings and attach new wallboard to that.** While this will contain the asbestos, the actual installation of furring strips and wallboard will disturb some of the asbestos, so you'll want to completely clear the room of furnishings and drape the floor and walls, i.e., cover the floors in 6-mil and the walls with 2- or 3-mil polyethylene plastic sheeting. Begin with the floor and run the sheeting up the wall about a foot and secure the top edge with masking tape. Secure the wall sheeting up at the top close to the ceiling and make sure that it overlaps the top edge of the floor covering.

   Use either 1x2s or 2x2s for furring strips, running in the same direction as the ceiling framing members. Before drilling any holes, locate and mark the location of the ceiling framing members so you'll have something solid to which to attach drywall or, if you choose, paneling (T&G material). If the ceiling

has an attic overhead, take advantage of it to find the framing members. In areas where you don't have attic access, use a stud finder such as the Triscanner by Zircon. You can set this particular unit to "stud deepscan" and locate framing members by hovering the unit ¼ inch over the surface. You don't want to drag a stud finder across the surface and disturb the popcorn. Mark the walls with blue painter's masking tape so you know where the ceiling framing members are.

Next cut the furring strips to length and pre-drill the holes—2 in. in from the ends and 16 in. apart. Then, using 2 ½- or 3-in. screws for 1x2s or 3 1/2- or 4-in. screws for 2x3s, secure the furring strips in place using temporary supports—one at each end and one in the center. Be sure to not cover the pilot holes with the supports and leave enough room around each hole so it is comfortable to work. This approach will allow you to drill up through the pilot hole with a cordless drill in one hand and a hose from a HEPA[1] vacuum in the other to catch the debris.

Alternatively (and highly recommended), apply shaving cream to the backside of each furring strip and position the strip with the shaving cream against the popcorn ceiling. While a helper (a live-in family member) holds the furring strips in place, drill through them into the ceiling. The shaving cream will help to contain asbestos dust as the drill bit is removed. Wipe off any debris left on the drill bit with a wet rag and discard the rag into a hazardous waste bag. Once all the furring strips are in place, attach drywall to them to encase the asbestos.

Tighten the screws with a cordless impact driver and again use the vacuum to catch any debris as the screw is installed. This process will minimize airborne fibers. Upon completion of your project, properly dispose of the plastic sheeting as described under "Cleanup Following Asbestos Removal." Remember to remove the vacuum cleaner bag at the end of your project and properly dispose of it with your other asbestos waste.

If furring strips would make your ceiling too low, install the wallboard directly to the popcorn ceiling using screws 6 to 8 in. apart. I suggest that you rent a drywall lifter to help you position and attach the drywall to minimize bumping or scraping against the popcorn (and releasing the asbestos fibers).

A cost-effective way to protect the popcorn from damage during drywall installation is to paint the ceiling with a high-quality latex paint. Spray painting is the best approach, but using a siped sponge roller is acceptable. Another solution, although more expensive, is to nail (not staple) Tyvex or a similar breathable house wrap product (not plastic—it doesn't breathe) over the entire ceiling using drywall nails and plastic flat washers such as those used to attach rigid foam board as seen at http://www.rodenhouse-inc.com. If you install house wrap prior to the drywall or ceiling paneling and follow the available guidelines, you will have no problem doing the work yourself.

2. **Paint the ceiling and live with the popcorn.** Use high-quality latex paint and apply it with a sprayer as rolling on the paint on will only disturb the asbestos fibers. As I stated earlier, intact and undisturbed popcorn ceilings containing asbestos don't pose a health risk.

[1]HEPA stands for High-Efficiency Particulate Air filter and refers to a material rated to trap 99.97 percent of airborne particles 0.3 microns and larger (available for rental through your local rental yard). ULPA (Ultra-Low Penetration Air) filters trap even more: 99.99 percent of particles 0.12 microns and larger.

What If Your Popcorn Ceiling Has Been Painted?

Another consideration is the possibility that at some time your popcorn ceiling has been painted. Latex flat paint, especially some variation of white, dries to approximately the same color as the original pop-

corn ceiling, so it can be difficult to determine if the ceiling has been painted. In general, painting encases (not encapsulates) the asbestos, but it will not prevent asbestos fibers from getting airborne if the surface is disturbed. ***It is not safe to remove an asbestos-containing popcorn ceiling just because it has been painted; correct and legal asbestos abatement procedures must be followed.*** A "wet" test, as described below, will help you determine the presence and type of paint on the ceiling.

To conduct a "wet" test, follow the same procedures as outlined in "Obtaining a Sample For Testing." However, allow 15 to 20 minutes for the water to soak in, respraying each test area a couple of times during this period. If the sample caught in a plastic bag is not thoroughly wet, then repeat the process by respraying and increasing the length of soak time. If the sample is still not thoroughly wet, then it's most likely a painted ceiling. Again, treat this ceiling as though it contains asbestos and send in a sample for laboratory testing.

If the ceiling contains asbestos and has been painted with an oil-based paint, then professional removal is required. During the removal process, the oil-based paint will not absorb the water used to soften the popcorn prior to scraping if off and to contain the asbestos fibers. However, if the ceiling contains asbestos and has been painted with latex paint, you may still want to hire a professional or you may want to remove it yourself following both the procedures outlined here in this article and the requirements of your local, regional, and state air quality and building authorities. In most cases latex paint will absorb enough water to contain the fibers.

Popcorn Ceiling With Asbestos: A Contractor's Removal Procedures

This article is not the final word on the subject; you'll need to follow the links in this article and do further research to ensure that your asbestos removal project is safe and legal. However, we do want to give you an overview of what's involved—from special protective clothing to tools—when a contractor removes an asbestos containing material.

The contractor begins the process by sealing off the room from the rest of the home using plastic sheeting to build an enclosure of two layers of 6-mil plastic on the floor and one layer of 2- or 3-mil plastic on the walls and three-leaf access doors. If there's no exterior door located in the work area, a sealed exit chamber will also be required to provide an exit to the exterior. This plastic enclosure and exit chamber will help prevent the asbestos fibers from entering other parts of the home.

A negative pressure air machine will be used during the removal process to control airflow and insure against fibers traveling throughout the home. The contractor will also use a HEPA vacuum, approved respirators[2] (half-face, dual-cartridge, each equipped with purple color-coded P-, N-, or R-100 [HEPA] filters), disposable clothing[3] (coveralls with built-in booties), eye protection, a supply of rubber gloves, asbestos waste disposal bags, and miscellaneous tools for the actual asbestos removal and room cleaning.

The removal process itself is quite simple. The contractor will spray the ceiling with warm water, scrape the popcorn off, and bag the waste for disposal. He or she will not attempt more than what can be removed and cleaned in one day.

When the entire project is completed, the ceiling debris, disposable clothing, and plastic sheeting will be taken to a disposal site or transfer station licensed to receive such hazardous waste. Air samples will then be taken to insure that the area is clean.

[2]Persons with beards often cannot be adequately fitted with this type of respirator and shouldn't work within this environment.

*[3]Disposable clothing and other safety equipment can be purchased through local dealers. Dealers can be found in the yellow pages under the heading "**Safety Equipment & Clothing**."*

Popcorn Ceiling With Asbestos: Removing It Yourself

Homeowners can remove an asbestos-containing

popcorn ceiling themselves, however, it can be an arduous process, even if the concentration level is only 3 to 8 percent. You will need to follow the guidelines outlined in this article and use the equipment and protective clothing listed under **A Contractor's Removal Procedures.** You will also need to file applications, pay any fees that may be required by your local/regional/state building and air quality authorities, and carefully follow the applicable regulations. Finally, don't overlook the following points. You will need to:

- Find at least three individuals for this task: two to actually remove the ceiling and a third person to remain outside the work area to assist with tools and other supplies. This will prevent the other two workers from removing and discarding their disposable clothing and putting on new each time they exit or enter the work area. ***Note: Homeowners cannot hire anyone to perform, or assist in, removal of a popcorn ceiling except for a state-certified asbestos contractor; however, they can perform the work themselves and receive assistance from live-in family members.***
- Post signs warning friends and family to stay away from the work area.
- Make sure the heating and air conditioning system is turned off.
- Remove ceiling light fixtures, fans, smoke alarms, or other devices. Since water and electricity don't mix, turn off the electricity or exercise caution as you spray the ceiling with water. No electricity plus the plastic sheeting used to encapsulate the room plus the required eye protection will make it difficult to see.
- Rent the equipment required to complete the project.
- Deposit the asbestos waste in a 6-mil transparent plastic bag, seal the bag with heavy-duty tape and place it into the second bag, and then seal the second (outside) bag with tape. Use a permanent marker to label each asbestos waste disposal bag with your last name, address, and date of removal on each bag.
- Completely decontaminate both the tools and the work area upon completion of the project.
- Transport the properly bagged and labeled asbestos debris to a disposal site or transfer station licensed to received such debris. You should contact the facility where you will be taking the waste before doing the work. They may only accept asbestos at certain times or days and may have specific bag labeling requirements. They may also need to have a copy of the asbestos work permits.
- Spend about 3 working days (start to finish) to clear an area approximately 600 square feet—including collecting supplies, setting up the containment area, removing the asbestos containing material, cleaning up, and disposing of the waste properly and legally. The work can be demanding and difficult to perform while wearing protective clothing. The water used to wet the asbestos will raise the room's humidity, reducing your visibility through the required eye protection, and make clothing hot, sticky, and uncomfortable. It is also difficult to breathe through a respirator and it can cause stress to your heart and lungs.

As you can see, there's a lot to consider before you can remove a popcorn ceiling. Actually, removing the popcorn ceiling is the easy part—the real work is in the preparation and the added measures and equipment required just to get to the removal stage. If you are still interested in tackling this challenging project after everything you've read so far, then good luck! Professionally speaking, I would hire a pro.

Removal Procedures—With or Without Asbestos

The easiest way to remove a popcorn ceiling is to get a sprayer—an air-pressured (pump) weed or fertilizer type—and fill it with a liquid detergent and warm water mixture (1 cup of detergent to 5 gallons of water). Minimize suds by adding the liquid detergent to the water, not the other way around. This will be a messy project so be sure to remove all the furniture or cover pieces too heavy to remove with 6-mil polyethylene plastic sheeting. Also cover the floors in 6-mil and the walls with 2- or 3-mil plastic sheeting. Do the floor first by

running the sheeting up the wall about a foot and securing the top edge with masking tape. Tape the wall sheeting up at the top close to the ceiling and make sure that it overlaps the top edge of the floor covering.

Spray the ceiling and allow it to soak in for 15 to 20 minutes. Working in sections about 4 feet square, scrape the ceiling into a cardboard box using a broad-handled 6- or 8-in.-wide taping knife (blade). To prevent the knife from digging into the surface, round the outside edges of the taping knife with a file. The cardboard box method is a slow process, but it will prevent the debris from falling on the floor, thus eliminating a potential accident—wet popcorn on plastic sheeting is slippery. A wider blade will speed up the process, but use one that will be comfortable when scraping into the box. Keep the sprayer filled with the liquid detergent and warm water mixture and remoisten the ceiling as needed. Have plenty of boxes on hand in the work area and, if your ceiling contains asbestos, be sure to dump the entire box into an asbestos disposal bag when it becomes too heavy to comfortably handle. The filled disposal bags will later be taken to a licensed disposal site or transfer station.

Once the asbestos-containing popcorn has been completely removed from the ceiling, use clean white wet rags to wipe the ceiling and walls down to the top of the tape used to secure the plastic sheeting. The purpose of this wipe-down is to remove any remaining asbestos, so turn the rag frequently and wipe with a clean surface to help prevent smearing the asbestos fibers around. These rags are contaminated and should not be rinsed; instead, dispose of them in an asbestos waste disposal bag.

Even with your best efforts to carefully remove the asbestos and contain the fibers there will be residual asbestos. After the ceiling dries and before you remove the plastic sheeting, paint the ceiling with two coats of latex primer to encase any remaining asbestos fibers. After the paint has thoroughly dried, patch any areas that may have sustained damage. Apply the compound so it's not too heavy to eliminate sanding these surfaces. Use light coats and allow each coat to dry thoroughly.

Cleanup Following Asbestos Removal

The cleanup phase of the project is very important and no shortcuts should be taken. Before you remove any of the plastic sheeting, plan your final exit. Along this route make sure that you have plenty of disposal bags and tape. The goal is to dismantle the work area and bag the debris in an orderly fashion, literally working your way outside the containment area to the final exit spot. Follow these steps:

- Spray down all the plastic sheeting one last time to make sure that the asbestos debris is thoroughly wet before removal.
- Start at the point that is highest and farthest away from the final exit. Remove the plastic from the wall and lower the sheets to the first layer of plastic on the floor. Carefully roll up the top layer of plastic on the floor and place it into a disposal bag. The second layer of sheeting on the floor will guarantee that you stay on plastic at all times. Once the perimeter plastic sheeting and the top layer of floor plastic have been bagged, roll up the second layer toward you while you remain on the sheeting.
- Continue removing and bagging plastic sheeting until you reach your final exit point. However, do not remove the last plastic sheeting on the floor at this point. Instead, you and your work partner should (in this order) spray each other down with water, remove your boots, turn gloves inside out as you take them off, remove your coveralls, and finally take off the respirators. Place all the removable items on the plastic including the respirator filters. Standing off the plastic, wipe down all safety equipment and tools used in removing the popcorn ceiling with a clean wet rag as you lean over the plastic. If you plan to keep any of these items, place them in a plastic bag for further cleaning outside. However, since asbestos fibers can remain afloat for a long period of time, it may be better to simply dispose of the items

and purchase new. Finally, roll up the plastic sheeting along with the clothing and seal it all in the double disposal bags.

- Make sure that all the debris is properly packaged and labeled for transport to the waste disposal site, and take a shower before transport.

Finishing Your Popcorn-Free Ceiling

Now you are ready to install whatever ceiling texture you want. My book, **Remodeling A Bathroom**, chapter 5, *Working with Wallboard* (pages 79 - 93), offers lots of ideas on different textures and how to apply them to walls or ceilings. If you just want a smooth ceiling, the book covers that as well.

This article does not cover all the ins and outs of asbestos removal with regard to a popcorn ceiling but it does offer an overview of the procedures involved. I encourage you to reread this article carefully, check out the hyper links to read what others have to offer, and consult your local/regional/state air quality authorities about the applicable regulations before starting this project. For your safety—and the safety of your family—it is important that you test your popcorn ceiling for asbestos and determine the proper course of action before you proceed with removal. Again, I recommend that you hire a certified professional to handle this project.

Source: Some of the information contained in this article has been taken in part from the U.S. Environmental Protection Agency and the Puget Sound Clean Air Agency. I encourage you to follow the links on their websites and read what they and others have to offer with regard to asbestos in popcorn ceilings.

*Send inquiries and/or questions to home improvement expert and author Leon A. Frechette at C.R.S., Inc., P.O. Box 4567, Spokane, WA 99220-0567. Or reach him via **email** through his website at www.asktooltalk.com.*

Work Safely! When using hand and power tools and accessories, be sure to read and follow the manufacturers' suggestions as outlined in their operating manuals and wear protective clothing and safety glasses. It is important that you follow the regulations required by your local/regional air quality authorities both for your safety and the safety of friends and relatives, especially when asbestos is involved.

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