



## **Building Air Quality**

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### **What Is Air Duct Cleaning - (ADC)**

You have probably seen an advertisement, received a coupon in the mail, or been approached directly by a company offering to clean your air ducts as a means of improving your building's indoor air quality. These services typically range in cost depending on the services offered, the size of the system to be cleaned, system accessibility, climatic region, and level of contamination.

Duct cleaning generally refers to the cleaning of various heating, ventilating, and air-conditioning (HVAC) system components, including the supply and return air ducts, above ceiling registers, grilles and diffusers, heat exchangers heating and cooling coils, condensate drain pans (drip pans), fan motor and fan housing, the air handling unit housing, and mechanical room.

If not properly installed, maintained, and operated, HVAC systems can become contaminated with particles of dust, pollen or other debris. If moisture is present, the potential for microbiological growth (e.g., mold) is increased and spores from such growth can be released into the building's occupied spaces. Some of these contaminants may cause allergic reactions or other symptoms in people if they are exposed to them.

If you decide to have your HVAC system cleaned, it is important to make sure the service provider agrees to clean all components of the system and is qualified to do so. Failure to clean a single component of a contaminated system can result in re-contamination of the entire system, thus negating any potential benefits. Methods of duct cleaning vary, although standards have been established by industry associations concerned with air duct cleaning. Typically, a service provider will use specialized tools to dislodge dirt and other debris in ducts, then vacuum them out with a high-powered vacuum cleaner.

In addition, the service provider may propose applying chemical biocides, designed to kill microbiological contaminants, to the inside of the duct work and to other system components. Some service providers may also suggest applying chemical treatments (sealants or other encapsulants) to seal or cover the inside surfaces of the air ducts and equipment housings because they believe the sealant will control mold growth or prevent the release of dirt particles or fibers from ducts. These practices have yet to be fully researched and you should be fully informed before deciding to permit the use of biocides or sealants in your air ducts. They should only be applied, if at all, after the system has been properly cleaned of all visible dust or debris.

### **Deciding on Whether or Not to Have Your Air Ducts Cleaned**

If a building is not experiencing complaints from allergies or unexplained symptoms or illnesses and if, after a visual inspection of the inside of the ducts, you see no indication that your air delivery system is contaminated with large deposits of dust or mold (no musty odor or visible mold growth), having your air ducts cleaned is probably unnecessary. [NOTE: It is normal for the supply and return registers to get dusty as dust-laden air is pulled through them. This does not indicate that your air ducts are contaminated with heavy deposits of dust or debris; the registers can be easily vacuumed or removed and cleaned.]

On the other hand, if a service provider fails to follow proper duct cleaning procedures, duct cleaning can cause indoor air problems. For example, an inadequate vacuum collection system can release more dust, dirt, and other contaminants than if you had left the ducts alone. A careless or inadequately trained service provider can damage your ducts or heating and cooling system, possibly increasing your heating and air conditioning costs or forcing you to undertake difficult and costly repairs or replacements.

### **You should consider having your building's air ducts cleaned if:**

There is substantial visible mold growth inside hard surface (e.g., sheet metal) ducts or on other components of your HVAC system. There are several important points to understand concerning mold detection in heating and cooling systems:

- Many sections of your heating and cooling system may not be accessible for a visible inspection, so ask the service provider to show you any mold they say exists.
- You should be aware that although a substance may look like mold, a positive determination of whether it is mold or not can be made only by an expert and may require laboratory analysis for final confirmation. Microbiological laboratories can tell you whether a sample sent to them on a clear strip of sticky household tape is mold or simply a substance that resembles it.
- If you have insulated air ducts and the insulation gets wet or moldy it cannot be effectively cleaned and should be removed and replaced.  
If the conditions causing the mold growth in the first place are not corrected, mold growth will recur.

Some research also suggests that cleaning dirty cooling coils, fans and heat exchangers can improve the efficiency of heating and cooling systems. However, little evidence exists to indicate that simply cleaning the duct system will increase your system's efficiency.

If you think duct cleaning might be a good idea for your building, but you are not sure, talk to a professional. The company that services your heating and cooling system may be a good source of advice. You may also want to contact professional duct cleaning service providers and ask them about the services they provide. Remember, they are trying to sell you a service, so ask questions and insist on complete and knowledgeable answers.

### **Choosing a Duct Cleaning Service Provider**

To find companies that provide duct cleaning services, check your Yellow Pages under "duct cleaning" or contact one of several trade associations including, ASCR, IIRC, or the National Air Duct Cleaners Association. (More information on these trade associations is found at the end of this document.) Do not assume that all duct cleaning service providers are equally knowledgeable and responsible. Talk to several service providers and get written estimates before deciding whether to have your ducts cleaned.

Check references to be sure other customers were satisfied and did not experience any problems with their heating and cooling system after cleaning.

### **Interview potential service providers to ensure:**

- that they are experienced in duct cleaning and have worked on systems like yours;
- that they will use procedures to protect you, your occupants, and your staff from contamination;

and that they comply with certain trade association cleaning standards and, if your ducts are constructed of fiber glass duct board or insulated internally with fiber glass duct liner, with the North American Insulation Manufacturers Association's (NAIMA) recommendations.

### **Ask the service provider whether they hold any relevant state licenses**

Several states require that air duct cleaners hold air conditioning contractor licenses. Another recent controversy involves the application of anti-microbial sprays and paints by contractors. Most chemicals used for this purpose hold an EPA registration number and are technically listed as a pesticide. Many states require that anyone applying a "pesticide" be licensed for that purpose. Others require licensing of pesticide applicators (the individual performing the service) but don't yet have a way to regulate the air duct cleaning industry.

### **What to Expect From a Duct Cleaning Service Provider**

If you choose to have your ducts cleaned, the service provider should:

- Open access ports or doors to allow the entire system to be cleaned and inspected.
- Inspect the system before cleaning to be sure that there are no asbestos-containing materials (e.g., insulation, register boots, etc.) in the heating and cooling system. Asbestos-containing materials require specialized procedures and should not be disturbed or removed except by specially trained and equipped contractors.

- Use vacuum equipment that exhausts particles outside of the building, or use only high-efficiency particle air (HEPA) vacuuming equipment if the vacuum exhausts inside the building.
- Protect carpet and office furnishings during cleaning.
- Use well-controlled brushing of duct surfaces in conjunction with contact vacuum cleaning to dislodge dust and other particles.
- Use only soft-bristled brushes for fiberglass duct board and sheet metal ducts internally lined with fiberglass.
- Take care to protect the ductwork, including sealing and re-insulating any access holes the service provider may have made or used so they are airtight.

Follow trade association standards for air duct cleaning and NAIMA's recommended practice for ducts containing fiberglass lining or constructed of fiberglass duct board.

## **Unresolved Issues of Duct Cleaning**

*Q. Does duct cleaning prevent health problems?*

A. The bottom line is: no one knows. There are examples of ducts that have become badly contaminated with a variety of materials that may pose risks to your health. The duct system can serve as a means to distribute these contaminants throughout a building. In these cases, duct cleaning may make sense. However, a light amount of dust in your air ducts is normal.

Duct cleaning is not considered to be a necessary part of yearly maintenance of your HVAC system. Research continues in an effort to evaluate the potential benefits of air duct cleaning.

Air duct cleaning service providers may tell you that they need to apply a chemical biocide to the inside of your ducts to kill bacteria (germs), and fungi (mold) and prevent future biological growth. Some duct cleaning service providers may propose to introduce ozone to kill biological contaminants. Ozone is a highly reactive gas that is regulated in the outside air as a lung irritant. However, there remains considerable controversy over the necessity and wisdom of introducing chemical biocides or ozone into the ductwork.

Among the possible problems with biocide and ozone application in air ducts:

- Little research has been conducted to demonstrate the effectiveness of most biocides and ozone when used inside ducts. Simply spraying or otherwise introducing these materials into the operating duct system may cause much of the material to be transported through the system and released into other areas of your building.
- Some people may react negatively to the biocide or ozone, causing adverse health reactions.
- EPA regulates chemical biocides under Federal pesticide law. EPA must register a product for a specific use before it can be legally used for that purpose. The specific use(s) must appear on the pesticide (e.g., biocide) label, along with other important information. It is a violation of federal law to use a pesticide product in any manner inconsistent with the label directions.
- EPA currently registers a small number of products specifically for use on the inside of bare sheet metal air ducts. A number of products are also registered for use as sanitizers on hard surfaces, which could include the interior of bare sheet metal ducts. While many such products may be used legally inside of unlined ducts if all label directions are followed, some of the directions on the label may be inappropriate for use in ducts. For example, if the directions indicate "rinse with water", the added moisture could stimulate mold growth.
- All of the products discussed above are registered solely for the purpose of sanitizing the smooth surfaces of unlined (bare) sheet metal ducts. No products are currently registered as biocides for use on fiber glass duct board or fiber glass lined ducts, so it is important to determine if sections of your system contain these materials before permitting the application of any biocide.

*Q. Do sealants prevent the release of dust and dirt particles into the air?*

A. Manufacturers of products marketed to coat and seal duct surfaces claim that these sealants prevent dust and dirt particles inside air ducts from being released into the air. As with biocides, a sealant is often applied by spraying it into the operating duct system. Laboratory tests indicate that materials introduced in this manner tend not to completely coat the duct surface. Application of sealants may also affect the acoustical (noise) and fire-retarding characteristics of fiberglass lined or constructed ducts and may invalidate the manufacturer's warranty.

Questions about the safety, effectiveness and overall desirability of sealants remain. For example, little is known about the potential toxicity of these products under typical use conditions or in the event they catch fire. In addition, sealants have yet to be evaluated for their resistance to deterioration over time, which could add particles to the duct air.

Most organizations concerned with duct cleaning, including EPA, NADCA, NAIMA, and the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) do not currently recommend the routine use of sealants in any type of duct. Instances when the use of sealants may be appropriate include the repair of damaged fiberglass insulation or when combating fire damage within ducts. Sealants should never be used on wet duct liner, to cover actively growing mold, or to cover debris in the ducts, and should only be applied after cleaning according to appropriate guidelines or standards.