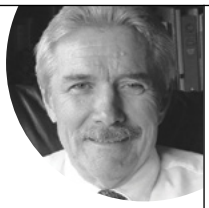

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What's Up with Duct Cleaning?

Air Handling Equipment Must Be Inspected, Cleaned, and Maintained to Provide Good IAQ

BY D. JEFF BURTON

Often EHS professionals are often asked about duct cleaning when receiving indoor air quality complaints. "Look, you can see dirty streaks along the air supply register—plus, the air smells funny," an employee or manager might say. "Shouldn't we get the ducts cleaned?"

NIOSH's many onsite IAQ investigations found that about 50 percent of all IAQ problems originated in the HVAC system.

Heating, ventilating, and air conditioning (HVAC) systems are major controllers of IAQ. However, NIOSH's many onsite IAQ investigations found that about 50 percent of all IAQ problems originated in the HVAC system. Ductwork and other air handling equipment (AHE) can become both the source and the pathway for dirt, dust, and biological contaminants. But if not performed properly, cleaning can be expensive and unproductive, and cause even more problems.

"Duct cleaning" now refers to the removal of dirt, slime, mold, debris, and other materials found in both the ductwork *and* other AHE components such as fans, heating and cooling coils, drain pans, filters, terminal boxes, return air plenums, outdoor air intakes, and air mixing locations. The process typically involves washing, brushing or vibrating, and vacuum cleaning.

When actual duct or AHE cleaning is to be performed by a contractor, first ask them to follow recognized good practices. They should keep the ducts and HVAC system under negative pressure during the cleaning operation, as this minimizes the discharge of dirt and dust into the occupied space, and protect the duct system and AHE, for example by avoiding unnecessarily cutting holes in the duct or duct liner.

Make sure that cleaning is done in a way that protects building occupants. For example, schedule cleaning for a time when the building isn't occupied, and provide at least ten air changes in the building when cleaning is finished but before occupants are readmitted.

FINDING A QUALIFIED CLEANING COMPANY

It isn't always clear whether a duct company you're considering contracting with is qualified to properly clean the HVAC system. Before you contract for duct and AHE cleaning you should ask the contractor: are they a qualified and reputable AHE cleaning firm? Can they provide references?

Other questions to consider include:

- Are they members of the National Air Duct Cleaners Association (NADCA)? Are their technicians certified by NADCA?
- Do they have a sensible, sound approach? Do they have the right kind of equipment?
- Can they show observable or known contaminants in the ductwork or other AHE?
- Has testing or observation confirmed contaminant type and quantity?
- Can or do contaminants (or their odors or byproducts) leave the system and enter the occupied space?
- Do we have a good idea of the source of these contaminants? Can the source be better controlled?
- Will the proposed cleaning effectively remove (neutralize, inactivate) the contaminants?
- Is cleaning the only solution, or the most cost effective?
- Will the cleaning process protect the HVAC equipment and occupants of the space during cleaning?
- Will the contractor guarantee that the ducts and AHE will be clean after completion?

If the answer to any of these questions is "no" or "I don't know," consider delaying cleaning until adequate answers, methods, and cleaning expertise are available.

Finally, and perhaps most importantly, ensure that the contractor follows industry-established standards concerning duct and AHE cleaning.

CURRENT STANDARDS FOR DUCT AND AHE CLEANING

The standard ANSI/ASHRAE 180-2018, *Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems*, covers good practices for inspecting and maintaining HVAC systems and AHE for the purpose of providing good air quality. The standard can help us determine whether cleaning should be performed.

NADCA established the standard NADCA ACR 2013, *Assessment, Cleaning, and Restoration*, for good cleaning practices. A NADCA-sponsored certification program has also certified many duct cleaning specialists across the country. Check with NADCA (**www.nadca.com**) for a list of certified people in your area, a list of current publications, and the status of its standards. It is good practice to use AHE cleaning firms who have personnel certified by NADCA and who follow NADCA standards and procedures.

Finally, some states now require air duct cleaners to have a mechanical contractor's license. Check your state's rules. Having such credentials can help ensure that the work they do is worthwhile.

BEST PRACTICES FOR DUCT CLEANING

The cleaners should locate vacuum cleaning and collection equipment outside the building. If vacuum collection equipment must be kept inside, HEPA filtration should be provided for vacuum discharge. Vacuum cleaning should usually be done with gentle brushing or vibration to lift settled materials.

Ductwork and air pathways are often insulated for thermal efficiency and noise control. Insulation generally consists of fibrous material mounted on the interior or exterior of the ductwork or AHE. IAQ concerns include fibers and fiber coatings flaking off and contaminating air pathways or occupied space, and microbiological growths within the insulation.

Current thinking suggests removing wet or contaminated insulation, only dry vacuuming the dry insulation during cleaning, and not disturbing or damaging the insulation. Meanwhile, installing thermal insulation on the outside of the duct when possible, keeping existing fiber insulation clean and dry, and properly maintaining system filters and replacing them on schedule can help minimize the need to clean insulation in the first place.

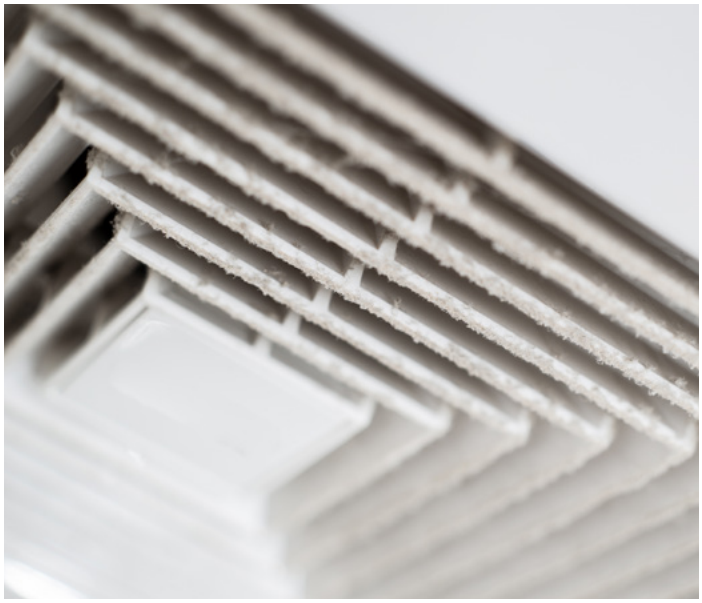
Remove, rather than clean, other water-damaged or bio-contaminated porous materials.

If cleaning chemicals are to be used in the AHE, select only EPA-registered products and follow label instructions. Currently, EPA has not registered any products for disinfecting or sanitizing ductwork. If sanitizers, deodorizers, or chemicals are used in other AHE, be sure they are completely removed before occupants return to the building.

Do not use sealants to cover interior-contaminated ductwork. Sealants have not been shown to be effective as a barrier to microbiological growth, their long-term health effects are unknown, and they may void fire safety ratings.

AN HVAC CONTAMINATION-PREVENTION PROGRAM

Avoid the need for frequent cleaning in the first place by minimizing dirt, debris, and microbiological growth in the system, maintaining filter systems and using filters rated at MERV 7 or greater, and conducting regular HVAC inspection and maintenance.



It is also important to follow good housekeeping practices in occupied spaces. Outdoor air intakes should be located in non-contaminated outdoor areas. Keep return air plenums and HVAC system components clean and dry, making sure that water drains at cooling coils and humidifiers. Follow ASHRAE and NADCA standards. Finally, instruct building occupants on how to help keep AHE clean and dry, and on how cleaning is performed. S

RESOURCES

AIHA: IAQ and HVAC Workbook, 4th Edition; **bit.ly/iaqhvacworkbook** (2017).

ASHRAE: ANSI/ASHRAE/ACCA Standard 180-2018, *Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems* (2018), **bit.ly/ashrae180** (PDF).

NADCA: "ACR, The NADCA Standard for Assessment, Cleaning, and Restoration of HVAC Systems," **bit.ly/nadca-acr**.

NIOSH: "NIOSH Indoor Air Quality Investigations in Office Buildings," **bit.ly/nioshtic2**.

NIOSH: "The NIOSH Approach to Conducting Indoor Air Quality Investigations in Office Buildings," **bit.ly/nioshtic2-1**.