

Hot Air – Dispelling Common HVAC Myths

By

Steven A. Lipson, CIH, CSP

Over the past several years, the media, private industry publications and IAQ product suppliers have gotten heavily involved in promoting and discussing products and methods for improving indoor air quality. Claims often center more upon sensationalism and marketing than on proven science, especially as pertains to mold; but also with respect to biocides, duct cleaning, air filtration, and others. The result often pains well-meaning property managers, as costly solution attempts either fail to solve the problem, or result in the creation of new ones.

Nearly all of the items and products noted in this article can be effective tools for providing better indoor environmental quality in the proper setting, and with proper usage; however, their use in many situations is at best, questionable, and at worst: dangerous.

Stand-Alone Room Air Filters

A recent publication by Consumer Reports (May, 2005) stated that Sharper Image's highly publicized *Ionic Breeze* and other "noiseless air cleaners" do not efficiently clean indoor air, and that several such units produce potentially hazardous levels of ozone. Sharper Image sued Consumer Reports in 2004 over a similar finding. Last month, the case ended with Sharper Image reimbursing Consumer Reports \$525,000 for legal defense fees, after a court found no reason to dispute the magazine's published findings.

The basic science behind the inefficacy of the Ionic Breeze is that the machine operates on a principal of electrostatic precipitation (the process can produce ozone), which efficiently removes particles from the air passing over the ionizing plates, but lacks a fan with which to circulate the cleansed air or to introduce new air to the filters: rendering the machine silent, but effectively useless. As a result, the unit provides very clean air in its immediate vicinity or in a controlled laboratory environment (basis for the manufacturer's statement that the unit is an efficient air cleaner), but does not clean the air in a real-world environment (per CR's findings). The Federal Government does not regulate the sale or usage of these items, since they only purport non-specific health benefits. As such, they are simply an appliance in the eyes of regulators.

Ozone, UV Lights & Biocides

Similarly, ozone, biocides, microbial growth inhibitors and UV light additions to HVAC systems have been heralded by their manufacturers for their ability to kill viruses and molds. Scientific data does not support their claims, and the EPA has placed restrictions on their usage due to potential health concerns. The issues are as follows:

Ozone is a strong respiratory irritant, as are many common biocides. In addition, since viruses are not scientifically classified as “living”, claims of their death are at the very least, questionable. Furthermore, not only are the abilities of ozone, UV lights and other biocides to kill mold disputable, but evidence points to the uselessness of doing so. The media-induced frenzy regarding “toxic mold” is currently unsubstantiated by the medical and scientific communities. Proven health effects associated with mold are limited to allergic response in average, healthy individuals (healthcare facilities are entirely different issues and are not included in this article). Allergic response is generally believed to be caused by a protein on the outside of the fungal spore membrane. Living or dead, this protein is still present and capable of causing the same health effects. It therefore appears that injecting biocides into the environment (which can be unhealthy to humans as well) is likelier to cause more harm than good.

Regarding application of microbial inhibitors to HVAC systems (or anywhere else in the indoor environment): the concept is flawed. Nearly all such inhibitors clearly state on the container and/or instructions, that their product may not be effective under conditions of excessive humidity or water intrusion. If the surface gets wet, mold can still grow. But common sense and experience state that if the surface remains dry, mold will not grow anyway. So why is an inhibitor necessary in such an environment? As with any chemical, adverse health effects and interference with building applications such as adhesives may also be a concern.

Duct Cleaning

Although highly publicized for its usefulness and health benefits, duct cleaning is rarely a good idea (although not entirely without benefits in the proper setting). Inspection of the ductwork is required to evaluate the system’s need and ability to undergo NADCA cleaning procedures. In most circumstances, duct cleaning is either unnecessary or outwardly problematic. Proper cleaning and maintenance of air handlers; appropriate filter media selection, installation and changing schedules; and general housekeeping procedures often eliminate the need for any such action.

HVAC system ducting in most newly constructed buildings is made of fiberboard. Other buildings have metal ducts with internal fiberglass insulation linings. These

surfaces are fragile, and are coated with a thin layer of protectant to keep the underlying fiberglass in place. Standard industry methods of duct cleaning use abrasive brushes to remove the surface particulate. These brushes can damage the insulation surface, leading to fiberglass release, erosion of the duct interiors, and a condition wherein ducts are more likely to accumulate and then release particulate buildup. This situation can result in more complaints of eye, sinus and respiratory irritation, itchiness, and other health complaints than were present prior to undertaking these expensive and well-meaning options.

In Conclusion

Nearly all of the items and products noted in this article can be effective tools for improving indoor environmental quality when used appropriately. Problems commonly stem from a rush to throw money at the issue, before properly selecting the best option. Common sense, and addressing of the cause rather than the symptoms, generally leads to the best solution.

The author is Director of Technical Services for Air Quality Consulting, Inc. (AQC) of Brandon, Florida (www.airqualityconsulting.com). He has 15 years experience in the field of industrial hygiene and evaluation of indoor air contaminants. He has lectured on IAQ and mold issues throughout the US and is a primary author of the pending ANSI Standard Z690 (mold).

AQC specializes in the evaluation of indoor air quality in commercial facilities. Personnel from AQC's Florida offices have performed IAQ and mold evaluations for projects encompassing forty seven States and much of Canada.