



The HVAC Inspection, Maintenance and Restoration Association®

# NADCA POSITION PAPER

## on Chemical Product Applications in HVAC Systems

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### Introduction

Awareness of indoor air quality has increased substantially in recent years, and the systems that supply air to our living and working spaces are critical to the maintenance of a healthy indoor environment. As the global industry's leading advocate and trusted resource for reliable information, The National Air Duct Cleaners Association (NADCA) is uniquely qualified to provide guidance for consumers and the industry on the best practices for inspecting, cleaning and restoring HVAC systems.

One topic that has generated both substantial interest and concern is the use of chemicals, cleaners, sealants and coatings inside air handling systems. Currently a broad diversity of information exists regarding the use and efficacy of these chemical products. In working with all parties associated with indoor air quality, NADCA recognizes the need to provide direction in this complicated and evolving area.

It is generally agreed that source removal of contaminants remains the single best method for cleaning and decontaminating HVAC systems. However, chemicals may be applied within HVAC systems for a variety of reasons. This position paper provides an overview of the products and associated techniques utilized in and around HVAC systems.

NADCA's goal is to provide sound guidance for all parties (consumers, regulators, and remediation professionals) that can be useful when evaluating specific structures and situations. Although the following information reflects the current state of the art for the use of chemicals in HVAC systems, readers should recognize that new developments regularly occur and should familiarize themselves with the most current information when determining the appropriate steps to take. Readers are encouraged to review NADCA's ACR Standard for Assessment, Cleaning & Restoration of HVAC Systems, for information regarding best practices related to cleaning and restoring those systems.

### Disclaimer

NADCA recognizes that differences in opinion will exist as to how to manage the use of chemical products. NADCA also recognizes that industry professionals will decide whether or not a chemical application is appropriate for a given HVAC system, based on the unique circumstances surrounding that system. Ultimately, the decision of whether or not to apply a chemical product in an HVAC system, and the selection of that product, rests with the owner of the system.

This document was written in the United States of America and is intended primarily for use in this country. This material may also prove useful for industry professionals and others operating outside of the USA. All users of this document are encouraged to refer to applicable federal, state/provincial, and/or local authorities having jurisdiction over the subjects addressed within this document.

### HVAC Contamination

Numerous types of contamination may be found within HVAC systems. Depending on the environment and conditions, these contaminants may contribute to mold/mildew (i.e., fungal growth) and other microbiological growth. Other contaminants may include debris from outside air sources, fire damage residue, dust, vermin, etc.

### Source Removal

Source removal is defined as the physical removal of contaminants and debris from internal HVAC system surfaces. Complete HVAC system cleaning removes the contaminants that may contribute to mold and other microbiological growth. Cleaning can also reduce household dust, increase energy efficiency, increase equipment life expectancy, and improve overall indoor air quality and comfort.

It is not necessary to apply chemical products to achieve source removal within an HVAC system. However, applying appropriate cleaning compounds may enhance the cleaning process (e.g., coils, hard surfaces, blowers).

## ■ Safety Considerations & MSDS

A variety of safety considerations must be taken into account as part of any chemical application within an HVAC system.

A Material Safety Data Sheet (MSDS) is a document produced by a chemical product manufacturer that contains information on the chemical makeup, use, storage, handling, emergency procedures and potential health effects related to a chemical product. The MSDS may contain more information about the material than the label on the container.

In the United States, the Occupational Safety and Health Administration (OSHA) requires that the MSDS be available at any job site where chemical products are in use. When concentrated products are used at the work site, manufacturers may make available a diluted solution MSDS (referred to as a “use solution”), as well as secondary-use labels for the application container for such diluted solutions. All application containers must have use labels affixed to them.

Other nations may have different regulations regarding the use of the MSDS, bulletin or materials and chemical products so this should be taken into consideration when delivering service outside the United States.

Some people are sensitive to certain chemical products. If there is a reason to believe that the use of a product would create a hazard, information about the potential hazard must be communicated to the building occupants and/or managers. In some circumstances, it may be necessary to perform work when occupants are out of the building and to adequately ventilate the building. With certain EPA-registered products, building evacuation is mandatory.

Workers must be trained to follow procedures on the label and in the current MSDS bulletin for the safe use, handling, and storage of any product used to treat an HVAC system. Appropriate personal protective equipment must be worn, including respiratory protection if required. Correct application procedures must be understood and carried out to avoid hazards from failing to use the product according to the manufacturer’s instructions.

## ■ Risk Management

Possible risks associated with chemical products include, but are not limited to:

- Allergic reactions
- Chemical burns
- Respiratory irritation or damage
- Eye injuries
- Poisoning
- Toxic fumes
- Exposure to carcinogens

It is recommended that the client sign a release authorizing the use of specific chemical products and acknowledging that he or she has been informed of risks associated with their use.

Products that are used to mitigate pests are required to be registered with the EPA. When using an EPA-registered product, a state pesticide applicator’s license may be required for the owner, firm, supervisor and/or worker. All users of this document are encouraged to refer to applicable federal, state/provincial, and/or local authorities having jurisdiction over the subject addressed within this document.

## ■ Categories of Chemical Products

A variety of chemical products may be used as part of an HVAC system cleaning process.

*Note: In general, chemical products that do not make a claim of antimicrobial activity are not required to be registered with the Environmental Protection Agency (EPA). Some exceptions exist.*

## ■ Antimicrobial Pesticides

*(including disinfectants and sanitizers)*

### Product definition

**Antimicrobial pesticide:** Any substance or mixture of substances intended to prevent, destroy, repel or mitigate a microbial pest. These agents kill or suppress the growth of microorganisms (bacteria, viruses and fungi). In the absence of product claims, if the product is composed of ingredients known to be pesticides and they do not have a non-pesticidal use, then the product is a pesticide. If the product’s mode of action is pesticidal in nature (no non-pesticidal use) then the product is a pesticide. If the intent is to distribute or sell the pesticide, it must be registered by the EPA as well as with the state in which it will be sold or used.

**Sanitizer:** The term “sanitizer” is often misused and misunderstood. A sanitizer is a substance or mixture of substances that kills a high percentage (99.9%) of, but not necessarily all, bacteria on a surface. Technically, the EPA defines a sanitizer as a substance or mixture of substances that reduces the bacterial population in the inanimate environment (on surfaces and objects) by significant numbers (e.g, 3 log<sub>10</sub> reduction or more), but does not destroy or eliminate all bacteria.<sup>1</sup> Another useful definition is: an agent that reduces contamination in the inanimate environment to levels considered safe as determined by public health ordinance.<sup>2</sup>

**Disinfectant:** An agent that eliminates a specific species of infectious or other undesired microorganism, but not necessarily bacterial spores, in the inanimate environment only.<sup>2</sup> Disinfectant products are often found to be effective against fungi and viruses as well as bacteria.

**Fungicide:** A substance that destroys fungi and yeast and/or fungal spores (on environmental surfaces) that may pose a threat to human health.

**Fungistat:** An agent that inhibits the growth of fungi of economic or aesthetic significance that are not considered to be human health related (on environmental surfaces). This agent has no fungicidal claim.

**Bacteriostat:** An agent similar to a fungistat in that it inhibits the growth of bacteria (on environmental surfaces) that is not considered to be human health related.

**Algaestats:** An agent similar to a fungistat in that it inhibits the growth of algae that is not considered to be human health related.

At this time, the EPA has not accepted any disinfectant, sanitizer or fungicidal products for use in the *ductwork* of HVAC systems. However, some of these products are accepted for use in *other parts* of HVAC systems.

Those products which have been accepted by the EPA for use in the ductwork of HVAC systems include the following claims:

- Fungistatic
- Bacteriostatic
- Inhibits odor-causing bacteria and fungi
- Inhibits stain and damage-causing bacteria, fungi, and algae
- Deodorizes
- Inhibits fungi and algae
- Cleaning (a non pesticidal activity; removal of contaminants)

Antimicrobial products are available for the treatment of coils, drain pans and other related HVAC system surfaces. Refer to the EPA-accepted product label for specific directions for treatment of these surfaces.

### Typical use

- The major use of antimicrobial products in HVAC systems is for the inhibition of microbial growth on hard surfaces within components such as air handlers, fans and duct interiors.
- Disinfectant products may be used in coils, drain pans, and other parts of the air handler.
- HVAC components that have been exposed to flood water or sewage contamination should be assumed to contain disease-causing organisms and should be disinfected prior to being placed back into service. Since no disinfectants are registered for use in air ducts, systems that have been exposed to contamination from floods, sewage, or similar biological contamination must be evaluated by a qualified individual prior to being placed back into service. Cleaning alone may or may not be satisfactory. Replacement of such duct sections may be necessary.

- Products chosen must include label directions detailing use in HVAC systems and their components and those directions must be followed.

### Application method

Products are generally applied through spraying, wiping or fogging. However, the application method chosen must be one that is in the label directions. Antimicrobials should only be applied after the surfaces have been cleaned. Surface soil or contamination can interfere with the efficacy of a product. Antimicrobial products are evaluated based on use pattern (locations of use) and application method for potential human exposure and risk. When using any antimicrobial product, follow the directions carefully and use the personal protective equipment as directed by the label.

### Pros

Properly used, antimicrobials can help reduce the risk or incidence of future microbial growth.

### Cons

Overuse of antimicrobial products can lead to needless exposure to chemicals.

Failure to follow label directions can pose risks or result in ineffective product performance.

In some applications it can be difficult to apply the product in a manner that ensures adequate coverage and dwell time, leading to ineffective product performance.

### EPA requirements

All antimicrobial pesticides for use in HVAC systems are required to be registered by the EPA. Products without specific HVAC directions are not to be used on these surfaces. A product has only been evaluated based on the directions for use listed on the label. The product is likely not to be effective if used in incorrect amounts or for a different dwell time.

Every pesticide label bears the following misuse statement: "It is a violation of Federal law to use a product in a manner inconsistent with its labeling." It means that if the product is used in a manner other than that which is directed by the label, such action may be illegal and put the applicator and occupants of the building at risk.

The label will also include the following information:

- Specific pest(s) against which the product is effective (meaning that the product has only passed the testing requirements for those organisms listed on the label).
- Sites (homes, hospitals, etc.) and surfaces (e.g., cooling coil) to which the product may be applied. This means that the product may only be used at those sites and on those surfaces which are identified on the label.

- Type of equipment or method used to apply the product including application rate and contact time.
- How often the product is applied. Reapply as directed by the label.
- In order for the product to be effective it must be used in accordance with the directions for use (application method and rate, and dwell time).
- Pesticide manufacturers may make available a diluted-solution or secondary-container-use label (which must be consistent with the EPA-approved label) when using concentrated products.

### Best Practices

- Follow instructions and safety precautions as per the EPA-accepted label.
- Use in a well-ventilated area.
- Keep in original or properly marked container.
- Label all containers. Where concentrated products are used, label containers holding diluted (ready-to-use) products.

## Sealants

### Product definition

Sealants are materials – liquids of varying viscosity or tapes - used to seal surfaces, joints, connections, gaps and openings.

### Typical use

Sealants are used in HVAC systems to control air leakage.

### Application method

A sealant may be applied like paint with a brush, roller, trowel, or spray equipment. It also may come in a caulk tube and be applied with a caulk gun. Sealants can exist as tape as well.

### Pros

- Improves energy efficiency of an HVAC system.
- Improves performance of an HVAC system.
- Reduces air leakage, as well as air intake from unconditioned areas.
- Some sealants have elastomeric (flexible) properties to maintain integrity of seal.

### Cons

- Difficult to apply after systems have been constructed.
- If the material used is not applied properly or does not have the proper characteristics, it may crack, split or separate from the surface it is applied to, allowing air leakage.

- During the application or cure, sealants may give off irritating fumes.
- Occupants may need to leave the building during application or while the sealant cures.
- System may need to remain shut down for a period of time to allow sealant to cure.

### EPA requirements

Most sealants do not make claims of antimicrobial activity, so they do not have to be registered with the EPA.

### Best practices

It is prudent to perform a duct leakage test to determine the condition of the ductwork and establish whether duct sealing would be beneficial.

Once the need has been established, the appropriate materials and methods can be chosen.

Correct protective equipment should be used by employees applying sealants.

Ensure occupants are not exposed to objectionable fume levels during application and drying.

## Resurfacing Materials

### Product definition

Resurfacing materials (also known as repair coatings) are coatings that are applied to surfaces that show signs of damage or degradation.

### Typical use

Resurfacing materials may be used to coat internally-lined or fiberglass ductwork to provide a smoother surface and control odors in the system. This reduces resistance of airflow in the system. Coatings secure loose fibers to reduce the potential that they will become airborne and enter the conditioned space. Resurfacing materials may also be used to protect duct surfaces from moisture and conditions that may lead to rust and corrosion. Some coatings have antimicrobial ingredients solely to preserve the coating and help retard the growth of mold and fungi on the coating film.

In no case should a coating be used in lieu of source-removal cleaning of an HVAC system. Refer to the NADCA Standard, Assessment, Cleaning & Restoration of HVAC Systems.

### Application method

Resurfacing materials are usually applied like paint with a brush, roller or spray equipment.

### Pros

- Can restore integrity to a duct system.
- Retards or repairs fiberglass deterioration.

- Saves costly replacement of duct board or lining in ductwork or air handler.
- Coatings can isolate non-removable particulate from the airstream.
- Coatings can smooth the interior profile of surfaces within HVAC systems to make them easier to clean in the future.
- Coatings can yield a smooth film surface when dry that reduces the probability of deposition and accumulation of foreign materials that could support future microbial activity.

### Cons

- Does not replace duct cleaning
- Adds an additional stage to an HVAC project after initial duct cleaning which will create additional expense.
- Occupants may need to leave the building while coatings are applied or curing.
- May affect sound attenuation where lining or fiberboard are used for that purpose.
- Some odors may linger after application.
- Using EPA-registered coatings (with antimicrobial properties) requires some form of licensing in some states which may add additional costs and burdens to the applicator.
- System may need to remain shut down for a period of time to allow sealant to cure.

### EPA requirements

Some coatings may contain antimicrobial ingredients to preserve the integrity of the product, but if the product does not make antimicrobial claims, EPA registration is not required. Coatings and sealants used as resurfacing and repair products that do not claim to kill microorganisms, and which claim only to prevent growth on or in the coating film, do not need to be registered by the EPA for use in ductwork. Such products fall within the scope of the Treated Articles Exemption of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). The EPA does not intend to register or regulate resurfacing coatings that do not make pesticidal claims.

### Best practices

- Ductwork, components, and surfaces to be coated should be thoroughly cleaned and evaluated before coating for best results.
- Materials must be used in accordance with manufacturer's instructions and in accordance with the label.
- Correct protective equipment should be used by employees applying resurfacing materials.

- Ensure occupants are not exposed to potentially hazardous fume levels during application and drying time.
- Users must comply with EPA, state and local regulations. Building codes and/or engineering specifications may require that coatings have been tested to certain ASTM test methods (such as ASTM E 84 and ASTM C 411) as required by the performance protocols of the National Fire Protection Association (NFPA) 90A/90B. (ASTM International is an organization that establishes test methods, among other things.) Before using any resurfacing coating, copies of this testing should be obtained from the product manufacturer.

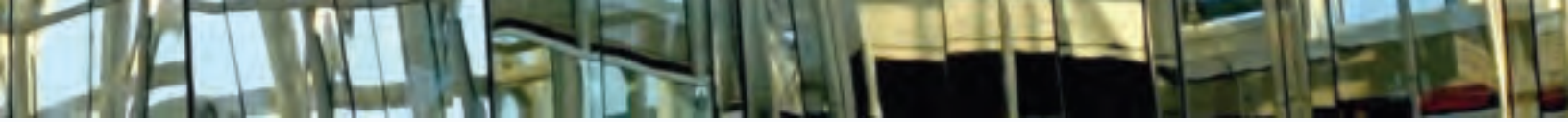
## Coil Cleaning Compounds

### Product Definition

Coil Cleaners are a subset of a broad category that includes all hard-surface cleaning agents. These cleaning compounds differ from general-purpose consumer products in that the soil that accumulates on surfaces of refrigeration and air-conditioning coils tends to be more resistant to removal than soil on walls, floors, counter tops and bathroom fixtures. In addition, coil structure (especially aluminum fins) can be more easily damaged than most environmental surfaces. For example, dried layers of organic debris on an evaporator coil can be almost as difficult to remove as baked-on oven soil, however, while a thin aluminum fin is easily damaged, the porcelain or stainless steel surface of an oven is highly resistant to damage.

There are three general formulation strategies that manufacturers follow in manufacturing coil cleaners:

- **Acid:** These products combine an acid (phosphoric, hydrofluoric, etc.) with a detergent. They generally have a pH of 3 or below. They work by creating a chemical reaction with the aluminum of the coil fins that mechanically helps release the soil that is then held in suspension by the detergent until it is rinsed off.
- **Alkaline:** These cleaners are formulated by combining sodium hydroxide, potassium hydroxide or some other caustic with a surfactant (soap). They normally have a pH of 10 or above and work in much the same way as acid cleaners by creating a chemical reaction that mechanically breaks soil free.
- **Detergent:** These are more complex formulations. They combine different detergents and other ingredients to create a strong cleaner. There is a wide variety of these formulations and they vary greatly in effectiveness against the types of soil that are found in coils. Detergent cleaners are sometimes called 'neutral' cleaners. This is an error as a



formulation would have to be exactly pH 7 to be truly neutral and detergent cleaners generally fall in a range between pH 4 and 9.

*Important Note: Sometimes, cleaners are formulated for specific types of soils. For example, systems that serve commercial kitchens may have greasy soil that requires a special formulation. In addition, regional conditions may favor one cleaning formulation over another. It is normal for contractors to select coil cleaners by trial, eventually settling on one or two formulations that work best for the conditions that they encounter. User and occupant safety is a critical issue and cleaners at both ends of the pH range tend to be unpleasant to use and handle.*

### Typical use

Traditionally, acid cleaners are used on condenser coils because the types of soils that are associated with their outside location are more easily removed by the acid formulation. In a like manner, alkaline cleaners sometimes work better with the greasy soil that is often found on indoor evaporator, chilled water, or heat pump coils. Because both of these cleaner types can be unpleasant to use and can damage coil surfaces, there has been a trend toward greater use of detergent cleaners. Acid cleaners should never be used indoors as they release unpleasant and potentially dangerous fumes unless rinsed completely from all surfaces in the air handler.

Coil cleaners are normally used for cleaning other portions of an HVAC system such as fans and housings, drain pans, supply and return grills and supply plenums that have an accumulation of soil and microbial growth. In special situations such as following a fire, an entire duct system may have to be cleaned with a detergent cleaner.

### Application method

Each manufacturer develops directions for the use of its cleaners, and in many cases these directions are based on actual research findings. For this reason, a user should always refer to the directions printed on the container label as the best way to effectively use the product. The following are generally applicable to all coil-cleaning compounds:

- Prepare the proper use dilution: The product label should recommend a starting-use dilution. A common dilution is one part cleaner to three parts water. In most cases water from the tap is acceptable.
- Apply to coil: Dilute cleaner can be applied with a hand sprayer or a power sprayer. In most situations, a power sprayer – not to exceed 150 psi - provides better coverage and deeper penetration into the depth of the fin assembly. Several sprayers are manufactured specifically for coil cleaning and

have enough power to penetrate, yet not enough to damage or bend the fins. Spraying directly facing the fins rather than across fins will result in less damage. Cleaner should be sprayed from side to side onto the coil assembly, starting from the bottom and working to the top. This allows loose soil to rinse out of the coil assembly as you proceed rather than falling down the fins and becoming more impacted.

- Allow soaking time: The soil-removal activity of most cleaners takes time so the cleaner should not be rinsed off too soon. Four to five minutes is a good general soak time. However, do not let the cleaner dry on the coil surface or it may be difficult to rinse off. Some coil cleaners are marketed as ‘no rinse’ as the condensate is supposed to wash the residue off. If a coil is cleaned during a dry time of year, that does not happen since there is little or no condensate.

### Pros

- The soil that accumulates on coils (especially cooling coils) is extremely difficult to remove. Unless a coil is cleaned very frequently, it is virtually impossible to remove the soil without using some cleaning compound.
- Cleaners speed up soil removal and thus less labor is needed for coil cleaning.
- More complete cleaning results in significant energy savings.
- Complete cleaning lowers the possibility of bacteria and fungi growing on coil surfaces being carried to occupied spaces.

### Cons

- Use of a cleaner risks exposure to chemicals that may be toxic or irritating to users and occupants.
- Some areas have regulations preventing the discharge of cleaning compounds (especially alkaline cleaners) into storm sewers or roof drains.
- Some cleaners (extremely high and low pH) can damage and shorten the life of the coils.

### EPA Requirements

The EPA does not have the authority to regulate cleaning compounds. However, in the spring of 2010, the EPA published a notice that they had received reports of cleaners that are being marketed with claims that they “remove microbial growth.” If marketers make such claims, those products will be regulated as antimicrobial pesticide products. Thus, it is important that service providers and sellers of coil-cleaning compounds not make any claims related to microbial growth control, prevention, or removal as this would make their product subject to registration by the EPA.

## Best Practices

- Select the product that represents the best balance between effectiveness, potential for least equipment damage, and lowest risk to users and occupants of spaces served by the equipment being cleaned.
- Follow printed label directions.
- For EPA-registered pesticides, use in compliance with the EPA-accepted label.
- Use the smallest quantity of cleaner that will do the job.
- Inform the customer that you will be using a coil-cleaning compound and provide him or her access to the label and MSDS.
- Rinse thoroughly with clean water even if a “no rinse” cleaner is used.
- Clean frequently enough that there is not a major buildup of soil.
- Perform multiple cleanings if needed to completely remove soil.
- Often coils can be more completely cleaned if they are removed and taken to a location outside or where plenty of water is available for thorough rinsing.

## ■ Soaps and Detergents

### Product definition

Soaps and detergents are technically known as surfactants, a word that comes from “surface” and “active.” Soaps and detergents are substances that, when added to water, cause the water to dissolve compounds more easily. They do so by changing the properties of the water’s surface.

### Typical use

Soaps and detergents are used in general cleaning situations where heavy-duty or specialty cleaners are not required. Uses include washing register grills and wiping down surfaces. They may also be included in the ingredients of more specialized products such as coil cleaners and heavy-duty degreasers.

### Application method

Soaps and detergents are simple to use. They are normally added to water in the amount desired, and the mixture is applied to the item being cleaned with a cloth, brush, or other scrubbing method. Check the manufacturer’s instructions for recommended product-to-water ratios and other application recommendations.

## Pros

- Simple to use.
- Easily available.
- Inexpensive.
- Effective for mild to moderate cleaning jobs.

## Cons

- May contain perfumes that occupants could find objectionable.
- Not effective or only partially effective for heavy-duty cleaning tasks.

## EPA requirements

Soaps and detergents are generally not required to be registered by the EPA unless pesticidal claims are made.

## Best practices

- Follow the manufacturer’s application instructions, including any safety recommendations.
- If product is scented, ensure occupants do not object to using it.
- Do not wet fiberglass or electrical components in HVAC systems.
- Avoid damage that may be caused by dripping and leaking while cleaning.
- Ensure any wet walking surfaces are taped off to avoid slips and falls.

## ■ Degreasers

### Product definition

A chemical product that dissolves fat-based and other water-insoluble substances. Degreasers vary in ingredients from simple surfactants (see above) to powerful caustics that can react with other chemicals.

### Typical use

Cleaning grease or oils from a hard surface. In HVAC systems, a degreaser may be required if the system has been exposed to cooking fumes or fat-based contaminants.

### Application method

“Cold cleaning” is generally referred to as cleaning below the boiling point of water or at room temperature. There are three general methods of cold cleaning - wipe or cloth, spraying, and dipping.

## Pros

- Very effective.
- Inexpensive.

- Easy to use.
- No special equipment required.

### Cons

- Must be kept in original or marked container.
- Potential allergic reactions for users and occupants.
- Some degreasers may be harmful to skin or if inhaled.
- Possible chemical sensitivity for users and occupants.
- Possible offensive odor during use.
- Containment of overspray.

### EPA classification

Degreasers are not required to be registered by the EPA.

### Best Practices

- Always use and wear personal protective equipment.
- Follow manufacturer's instructions and safety precautions.
- Use in well-ventilated area.
- Keep in original or properly marked container.

## Deodorizers

### Product definition

Deodorizers remove or mask unwanted odors inside an HVAC system or building. Four types of deodorizers are common:

- Receptor blockers block scent receptors in the nose from detecting certain odors.
- Oxidizers chemically combine with (oxidize) sources of odors on surfaces.
- Air sanitizers inactivate odor-causing microorganisms.
- Masking chemicals overwhelm an odor with another scent.

### Typical uses

Remediating odors from fire smoke damage, tobacco smoke damage, dead animals, water damage, and mold and mildew.

### Application methods

Deodorizers may be sprayed or they may be placed, as liquids or solids, in a location that allows them to evaporate slowly into the building space.

### Pros

- Easy to apply.
- Reduces or eliminates odors.

### Cons

- May mask but not remove odor.
- Building occupants may have objections to the use of chemicals or scents in the product.
- Occasionally people report asthma attacks, allergic response, headaches, breathing difficulties, or other health problems when exposed to air fresheners or deodorizers.

### EPA Requirements

Any deodorizers for which pesticidal claims are made, such as sanitizers that inactivate odor-causing microorganisms, must be registered with the EPA.

### Best practices

- When using a scented product, ensure the occupants have no objection to the product before applying.
- Remove the source of odors whenever possible.
- Avoid using masking deodorizers if possible since this is only a temporary remedy.
- Follow manufacturer's instructions for safety of occupants and workers.
- For EPA-registered pesticides, use in compliance with the EPA-accepted label. ●

### References

- <sup>1</sup> EPA Pesticide Registration Manual: Chapter 4 - Additional Considerations for Antimicrobial Products: <http://www.epa.gov/pesticides/bluebook/chapter4.html>
- <sup>2</sup> Seymour S. Block, *Disinfection, Sterilization and Preservation*, 5th edition, 2001.
- <sup>3</sup> ASHRAE/ACCA/ANSI 180 - *Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems* (American Society of Heating, Refrigeration, and Air-Conditioning Engineers, Air Conditioning Contractors of America, and American National Standards Institute)
- <sup>4</sup> NADCA ACR - *Assessment, Cleaning & Restoration of HVAC Systems*
- <sup>5</sup> IICRC S520 - *Standard and Reference Guide for Professional Mold Remediation* (Institute of Inspection, Cleaning and Restoration Certification)
- <sup>6</sup> OSHA: MSDS Sheets on the work site: Standard 1910.1200: [http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=standards&p\\_id=10099](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10099)
- <sup>7</sup> National Institute for Occupational Safety and Health (NIOSH) *Pocket Guide to Chemical Hazards*: <http://www.cdc.gov/niosh/npg>



# Frequently Asked Questions

## **What is the position of the National Air Duct Cleaners Association (NADCA) regarding the use of chemicals in ductwork?**

NADCA does not recommend the use of chemicals within ductwork unless there is a specific need.

## **Is sanitizing ductwork legal?**

NO. The EPA has not registered any products for sanitizing or disinfecting ductwork. Further, no fungicides are registered for use in ductwork. As noted earlier in this document, IT IS A VIOLATION OF FEDERAL LAW TO USE A PRODUCT IN A MANNER INCONSISTENT WITH ITS LABELING. For antimicrobials, this law is the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Therefore, any claims of sanitizing or disinfecting ductwork would require the use of a product in a manner inconsistent with its labeling, which is a violation of FIFRA. Violations of FIFRA can result in fines and criminal penalties from the EPA.

This is a short answer. For a more comprehensive explanation of this complex issue, please refer to the “Antimicrobial Products” section of this document.

## **What does NADCA recommend for cleaning heating, ventilation and air conditioning (HVAC) systems?**

NADCA recommends “source removal” as the best method for cleaning HVAC systems. For best results, the entire HVAC system should be cleaned, including coils, blowers, and other components of the system. These components, which are exposed to the air stream, become contaminated with dust and other unwanted materials, and should be cleaned as warranted. Readers are encouraged to review NADCA’s ACR Standard for Assessment, Cleaning & Restoration of HVAC Systems, for information regarding best practices related to cleaning and restoring those systems.

## **When is a chemical application acceptable?**

The application of chemicals in an air conveyance system is acceptable only when the product is legally approved for the application for which it will be used. At this time, the EPA has not accepted any disinfectant, sanitizer or fungicidal products for use in the ductwork of HVAC systems. However, some of these products are registered and accepted by the EPA for use on certain components in other parts of HVAC systems.

## **Should the client review the MSDS and Product Label before authorizing application?**

Yes, that is recommended.

## **Should occupants leave the building during chemical application?**

In some circumstances, it may be necessary to perform work when occupants are out of the building and to adequately ventilate the building before occupants return. With certain EPA-registered products, building evacuation is mandatory. If there is a reason to believe that the use of a product would create a hazard, information about the potential hazard must be communicated to the building occupants and/or managers.

## **How long should the client stay out of the house or building after chemical application?**

Until fumes or scents are no longer at a level to produce discomfort or concern for occupants. Typically, this is 2 to 8 hours with adequate ventilation.

## **What if the client has asthma, allergies, or chemical sensitivities?**

It is recommended that the client sign an informed consent agreement authorizing the use of specific chemical products and acknowledging that he or she has been informed of risks associated with their use. The client with concerns should talk to his or her doctor or other healthcare practitioners.

## **What are the advantages to using these products?**

These products are designed to provide the benefits described above in the section reviewing each product. See the Pros and Cons subsections for each product.

## **What are the risks to using these products?**

The risks are discussed in the MSDS and the label for each product.

## **Are there any chemical products used in HVAC systems that can create unintended effects?**

Some products may have properties (such as corrosivity, off-gassing, environmental impact) that customers might see as negative or objectionable. As part of the selection process for what products you will carry or use, you should determine which, if any, candidate products are associated with any of these potential problems. The product(s) may have other positive features that will lead you to use the product in spite of these issues. However, you should be sure that your customers are aware of the facts and accept the possible risks. ●

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