

EPA: Indoor Air Quality Resources and Concerns Associated with the Use of Pesticides in Ventilation Systems

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The Environmental Protection Agency was established in 1970 when America was just becoming aware of the growing environmental pollution problem. The Agency was created in part as a response to the growing public concern about the deteriorating conditions of the land, water and air. Raw sewage, industrial and feedlot wastes were being discharged into rivers and lakes while smokestack and auto exhausts caused air pollution while the land was polluted by indiscriminate dumping of municipal and industrial wastes that later contaminated soils and aquifers. EPA's overarching mission is to protect human health and to safeguard the land, water and air. An important aspect of this goal is the protection of human health and the environment from adverse risks associated with pesticides.

The Office of Air and Radiation plays an important role in safeguarding the air we breathe. A wealth of information is available on their website. *Mold Remediation in Schools and Commercial Buildings* provides valuable information to building managers and those responsible for building maintenance. *A Brief Guide to Mold, Moisture, and Your Home* contains advice for homeowners and renters on mold clean up and how to prevent mold growth. Additional information may be found at www.epa.gov/mold or www.epa.gov/nscep or by phone at 1-800-490-9198. This office also provides numerous publications on asthma including *IAQ Tools for Schools, Managing Asthma in the School Environment* www.epa.gov/iaq/schools/asthma. I-BEAM Software designed to assist in managing indoor air quality in large building can be found at www.epa.gov/iaq/largebldgs/ibeam_page.htm. *Guidance for Protecting Building Environments from Airborne Chemical, Biological, or Radiological Attacks* with guidance on filtration and air cleaning systems is available at www.epa.gov/iaq/homeland_security.html. *IAQ Design Tools for Schools* is another excellent resource which provides detailed guidance and links to resources to design new schools, repair, renovate and maintain existing facilities including preliminary design phases, controlling pollutants and sources, HVAC, moisture control, construction, commissioning, renovations and repair, operations and maintenance, as well as the ever popular portable classroom.

Intrinsic to understanding the use of pesticides within an HVAC&R system is a comprehensive understanding of what defines a pesticide. A pesticide is a product which is intended to prevent, destroy, repel or mitigate any pest. Typically these claims are either on the product packaging, collateral literature, on the web, or described verbally. A pesticide is effective against one or more pests. A pest is defined as any insect, rodent, nematode, fungus, weed, or any other form of terrestrial or aquatic plant or animal life or virus, bacteria or other microorganism (except viruses, bacteria or other microorganisms on or in living man or other living animals) which the US Environmental Protection

Agency (EPA) declares to be a pest. Products which are effective against the following types of pests: plants, insects, fungus, rodents, and antimicrobials which include bacteria, viruses, fungi and prions are regulated by the EPA. The following types of products are regulated by the Food and Drug Administration (FDA), not the EPA: products intended to control antimicrobial pests in or on humans, animals, animal feed, processed food, drugs, cosmetics and beverages.

The following claims are typically found on antimicrobial pesticide labels: kills, controls, sanitize, disinfect, sterilize, bactericidal, and fungicidal. A pesticide for use on inanimate surfaces must be registered by the EPA and include an EPA Registration Number formatted: XXXX-XX. This registration number is used to access information about the product from the EPA web site: www.epa.gov/pesticides/pestlabels/ Pesticide label images which have been accepted or approved by the EPA may be viewed at this website. A label includes information about the ingredients which provide the pesticidal activity, precautions to be taken when using the product, first aid, storage and disposal, EPA registration number as well as directions for use of the product.

The directions for use list the specific pests against which the product is effective, the sites, such as schools and farms, and surfaces, such as floors and animal feeding equipment to which the product may be applied, the type of equipment or method used to apply the product, the rate, contact time, and how often the product is to be applied. A pesticide product may only be used at those sites and on those surfaces which are identified on the EPA accepted label. These products have only passed the testing requirements for those sites and organisms listed on the accepted label, and are only effective against those organisms when applied to the surface in agreement with the contact time on the label. It is a violation of Federal law to use a product in a manner inconsistent with its labeling.

EPA issued a letter on March 14, 2002 summarizing our concerns that only products with specific directions for use in HVAC&R systems should be used in these systems. There are about 15 antimicrobial products which have been approved for use in HVAC&R duct work. Several of these products have gone through an assessment which meets today's standards, although the majority of these 15 products have not been through the assessment. If the proper assessment has not been completed, there are concerns regarding the exposure to applicators and building occupants during application of the product, that these products do not include adequate directions for use on duct work surfaces, and whether or not the pesticidal claims are supported by data. There are reported incidents of these products being used with building occupants becoming ill during or after the application of the product. At this time applicators can continue to use products with directions for application to duct work in accordance with the EPA approved label. These products will list ducts, air ducts, duct work, or HVAC on the label.

Use of antimicrobial products on or in HVAC&R (heating, ventilation, air-conditioning and refrigeration) systems is significantly different from use of the same products on other hard, non-porous or porous surfaces, and yet, many products not

specifically registered for HVAC&R systems are being used. EPA has developed draft guidance in the form of a draft Pesticide Registration Notice (PRN) for pesticide manufacturers regarding labeling for EPA-registered sanitizers, disinfectants, and other antimicrobial products. The proposed guidance was posted in the Federal Register on Sept. 22, 2006 and is intended to clarify which antimicrobial products may be used for treatment of HVAC&R systems. The Agency has received public comments during the two 60 day comment periods. We expect to issue this policy in final form in the near future.

There seems to be much confusion about the use of the term “sanitize.” Sanitize is a claim based on efficacy data which has been reviewed by the EPA. This claim describes the kill of 99.9% (or 3 log reduction) of the bacteria on a surface in 5 minutes or less. Since bacteria is typically not the pest of concern in an HVAC&R system, this level of pesticidal activity is not necessarily appropriate for use in these systems. In addition, the EPA currently does not have an acceptable efficacy method to show that a product can either sanitize or disinfect an HVAC&R system. Thus claims should not be made to sanitize or disinfect duct work.

Questions are often raised about using bleach in duct work. If bleach is being used to control a microorganism, use a registered bleach product which lists the organism of concern and the site and surface at which the product is intended to be used on the label. There are currently no bleach products which include HVAC&R as a use site on the label.

We often receive questions regarding the use of paints and coating in HVAC&R duct work systems. If the paint or coating label does not list an EPA Registration Number, then any antimicrobial product which has been added to the formulation is present to protect the paint film or coating only, not the surface of the duct or other substrate to which it is applied.

The following information is typically present on the label of an antimicrobial product which has been through the proper assessment for HVAC&R use:

- 1) A description of the microbes the product will control
- 2) Most of these products will be bacteriostatic or fungistatic. This means that the product provides some level of control or reduction of the number of organisms, but is not effective enough that a kill claim may be met.
- 3) HVAC&R directions are distinctly separate from other directions on the label.
- 4) Directions are placed under a heading such as: air ducts, HVAC, or HVAC&R
- 5) Label provides extensive information on a complete HVAC&R program:
Inspection, Correction of conditions leading to microbial growth & moisture buildup, Cleaning, and Treatment with an antimicrobial product if warranted.

These labels include specific directions for proper inspection of an HVAC&R system and the use of antimicrobial products only in systems which are in sound mechanical condition with specific references to industry guidelines. These directions

also identify conditions that suggest repair or replacement is necessary. Also included are directives to correct the problem which lead to microbial growth in the first place and instructions that the HVAC&R system and associated components be cleaned prior to treatment, that the product is only for use in systems where visible mold growth is detected, and treatment may only take place after removing the growth, identifying and correcting the conditions which lead to the growth. The labeling must list the specific HVAC&R components to be treated. Examples of these types of surfaces include: bare metal ducts, flexible ducts, and semi porous ducts (plaster or concrete). The use of these products on lined ductwork has not been approved due to efficacy concerns.

A detailed description of application equipment, devices or other methods of applying product to HVAC&R surfaces, mixing instructions, and the application rate for each application method which describes the surface area to be treated per gallon of use solution will also be included on the label. Finally these directions include: a listing of the protective equipment which is required for the applicator, the status of the system during treatment or the isolation of a specific section during treatment and whether the premise is to be vacated (including specifics as to the floor/corridor) or occupied during treatment.



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June 14, 2008



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Today we will discuss:

- History of EPA
- Indoor Air Quality Resources
- IAQ Tools
- Draft PR Notice for pesticide use in HVAC&R systems
- Definition of a pesticide and pest
- Pesticide labeling
- How to use these products
- Products for use in HVAC&R
- Inspection and maintenance of HVAC&R systems



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Environmental Protection Agency History

- EPA was established in 1970
- Mission: Protect Human Health & Safeguard the Environment
- Regulate Pesticides under FIFRA (original statute 1947) and FFDCFA
- Our regulations affect 40,000 commercial pest control firms, several million professional users and 90 million households



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Indoor Air Quality Resources

Available on the web from
Office of Air and Radiation

Order Publications:

Website: www.epa.gov/nscep

Phone: 1-800-490-9198

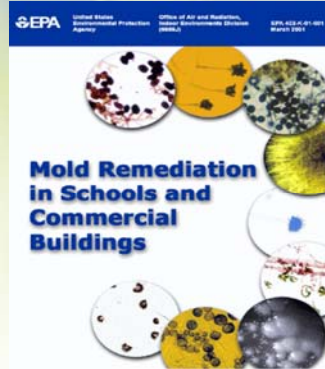


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Mold Remediation in Schools and Commercial Buildings

- Audience:
 - Building managers and those responsible for building maintenance
 - Reference for professional remediators
 - Anyone addressing mold problems in buildings



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A Brief Guide to Mold, Moisture, and Your Home

- Audience: homeowners and renters
 - How to clean up residential mold
 - How to prevent mold growth

www.epa.gov/mold





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IAQ Tools for Schools, Managing Asthma in the School Environment

www.epa.gov/iaq/schools/asthma

I-BEAM software - managing IAQ in large buildings



www.epa.gov/iaq/largebldgs/ibeam_page.htm



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Homeland Security and Indoor Environments

Guidance for Protecting Building Environments from Airborne Chemical, Biological, or Radiological Attacks

- **Guidance for Filtration and Air-Cleaning Systems**

www.epa.gov/iaq/homeland_security.html



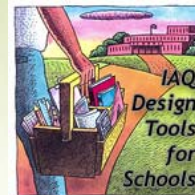


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IAQ Design Tools for Schools

- www.epa.gov/iaq/schooldesign/
- Provides detailed guidance and links to resources to design new schools, repair, renovate and maintain existing facilities
- Controlling Pollutants and Sources
- HVAC systems



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Definition of HVAC&R

- Many surfaces associated with HVAC systems including drain pans, evaporative or cooling coils and filtration equipment
- In this presentation, HVAC&R refers to ducts, duct fittings, duct liners, fans, supply ducts, return ducts, exhaust ducts, intakes, outlets, louvers, diffusers, dampers, plenums, outdoor air intakes, air handling units, or any other ductwork
- Surfaces viewed separately due to differing exposure concerns



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Draft Pesticide Registration Notice for Antimicrobials Intended for Use in HVAC&R Systems

- Use of antimicrobial products in these systems differs from use on other hard surfaces
- Many products which are not intended for use on HVAC&R surfaces are being used
- What is a PR Notice??
- PR notice provides definitive language for antimicrobial labels so that users can determine which products are intended for HVAC&R use
- Propose that a "Do Not Use" statement be added to labels of products which have not been approved for HVAC&R use.



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HVAC&R PR Notice

- We have made this notice available for two 60 day public comment periods. Currently the docket is closed as we respond to comments.
- The draft notice and comments may be viewed at www.regulations.gov
- Select Environmental Protection Agency
- Select keyword: 2006-0351
- Double click on blue docket ID



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What is a pesticide?

- A product which is intended to prevent, destroy, repel or mitigate any pest
- Typically make claims either on the product packaging, collateral literature, on the web, or verbally
- In the absence of claims, if a product is composed of ingredients known to be pesticides which do not have non-pesticidal activity, then the product is a pesticide
- Mode of action of the product is pesticidal in nature (no non-pesticidal utility)



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What is a pest?

- Any insect, rodent, nematode, fungus, weed, or any other form of terrestrial or aquatic plant or animal life or **virus, bacteria or other micro-organism** (except viruses, bacteria or other micro-organisms on or in living man or other living animals) which the Administrator declares to be a pest



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How do I know if I'm making a pesticidal claim?

- Controls fungus
- Destroys disease causing organisms
- Inhibits the growth of mold
- Sanitize
- Disinfect
- Sterilize
- Eliminates all microbial growth
- These are pesticidal claims, the product used must be registered with the specific claim for the surface being treated



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Who has jurisdiction?

- Environmental Protection Agency (EPA) regulates pesticides: herbicides, insecticides, fungicides, rodenticides, and antimicrobials
- Insecticides which are applied to humans and animals (mosquito repellants, flea and tick remedies) are regulated by the EPA
- With the exception of products intended for control of antimicrobial pests in or on humans, animals, animal feed, processed food, drugs, cosmetics and beverages which are regulated by the Food and Drug Administration



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How do I know it's a pesticide?

- Look for claims that the product is intended to prevent, destroy, repel or mitigate any pest
- Key words: Kills, Controls, Sanitize, Disinfect, Sterilize, Bactericidal, Fungicidal
- A pesticide for use on inanimate surfaces must be registered by the EPA and include an EPA Registration Number formatted: XXXX-XX. This identifies the company and product. It may be used to gain additional information from EPA



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How are Pesticides Labeled?

- The "label" is the written, printed or graphic matter on or attached to the pesticide or any of its containers or wrappers
- Required information on the label includes the Ingredients, Precautionary, First Aid, Storage & Disposal statements, company name and address, EPA registration number as well as the Directions for Use



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The real definition of labeling...

- The broader definition of labeling includes: information on the web, brochures describing the product, any additional printed or graphic material, and verbal claims.
- All labeling must be in agreement with the EPA accepted label.



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Directions for Use

- This section of the label addresses:
 - Specific pest(s) against which the product is effective
 - Sites (schools, hotels) and surfaces (toilets, dishes) to which the product may be applied
 - Type of equipment or method used to apply the product including application rate and contact time
 - How often the product is to be applied



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How Can I Use the Product?

- Use only at those sites and on those surfaces which are identified on the label
- Product has only passed the testing requirements for those organisms listed on the label
- In order for the product to be effective it must be used in agreement with the directions for use (application rate, contact time)
- Reapply as directed by the label



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Directions which are not specific

- Difficult to list all of the possible use sites on label
- Old labels tend to be very broad “use on hard non-porous surfaces”
- Agency issued letter on 3/14/02 clarifying that products without specific HVAC&R directions are not to be used on these surfaces



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Why Follow the Directions?

- It is a violation of Federal law to use a product in a manner inconsistent with its labeling
- Product has only been evaluated for those uses and application rates listed on the label
- May be putting the applicator and occupants of the facility at risk to use the product in a different manner
- Product is likely not effective if used at a different rate or for a different contact time



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Which products may be used in HVAC&R?

- Currently there are 15 antimicrobial products that have been approved for this use
- Several of these products have gone through an assessment which meets today's standards
- Majority of these products have not been through risk assessment for HVAC&R use
- Concerns: exposure to applicators and building occupants, labels do not include adequate directions for use on these surfaces, can pesticidal claims for these surfaces be supported by data?



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Agency concerns regarding HVAC&R products

- HVAC&R is a unique use pattern which does require an assessment to determine if exposure could create a risk
- Do have reported incidents
- Can continue to use products with HVAC&R directions in accordance with the EPA accepted label



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Products for use on HVAC&R

- These products list ducts, air ducts, duct work or HVAC on the label
- Check to be sure product has been registered by EPA
- As long as the product is used according to the EPA accepted label, it can legally be used on these surfaces
- Website to view accepted labels:
www.epa.gov/pesticides/pestlabels/



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Products Registered for HVAC Use as of 6/4/08

<u>Reg. No.</u>	<u>Name of Record</u>	<u>Type of HVAC Use</u>	<u>Last Stamped Label</u>
8383-3	Sporicidin Disinfectant Solution	Air duct cleaning only	6/18/07
8383-4	Sporicidin Brand Disinfectant Spray	Air duct cleaning only	3/24/97
1258-840	Zinc Omadine Powder Industrial Microbiostat	Inhibit mildew & bacteria in HVAC at point of manufacture	3/15/06
9804-1	Oxine	Fungistatic, bacteriostatic Treat unlined air ducts	11/21/07



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Products Registered for HVAC Use as of 6/4/08

<u>Reg. No.</u>	<u>Name of Record</u>	<u>Type of HVAC Use</u>	<u>Last Stamped Label</u>
71227-1 *	Zeomic Type AJ10D Silver Zeolite A	Preservative coating at manufacture & in place, no residential, including lined ducts	3/15/07
67212-1 *	BBJ Microbiocide	Odor, stain, damage causing bacteria, fungi, and algae, treat unlined air ducts	4/15/03
67212-3 *	BBJ Mold Control	Odor, stain, damage causing bacteria, fungi, and algae, treat unlined air ducts	1/25/07
63836-1	Foster 40-20 Fungicidal Protective Coating	Odor causing bacteria, mold on HVAC including lined ducts	3/19/04



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Products Registered for HVAC Use as of 6/4/08

<u>Reg. No.</u>	<u>Name of Record</u>	<u>Type of HVAC Use</u>	<u>Last Stamped Label</u>
63836-2	Foster 40-30 Fungicidal Protective Coating	Odor causing bacteria, mold on HVAC including lined ducts	8/1/07
43670-1	Intersept	HVAC coating: fungistat, bacteriostat	7/29/05
70263-5	Microban Hospital Spray Plus	Odor causing bacteria, fungus, deodorizes air ducts	2/3/04
9804-3	Odorid	Deodorize ductwork	3/17/05



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Products Registered for HVAC Use as of 6/4/08

<u>Reg. No.</u>	<u>Name of Record</u>	<u>Type of HVAC Use</u>	<u>Last Stamped Label</u>
73696-2 *	Hydrated Lime Manufacturing Use Product	Odor causing bacteria, mold, mildew coating at manufacture or unoccupied bldg.	9/29/03
10324-169 *	Maquat 615-MR	Fungistatic, bacteriostatic, treat unlined air ducts, Professional Use Only	12/1/06
10324-174 *	Maquat 86-MR	Fungistatic, bacteriostatic, treat unlined air ducts, Professional Use Only	6/26/07



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Data Requirements for HVAC&R (new products and changes to existing products)

- In order for an HVAC&R use to be approved for an antimicrobial product, adequate toxicity and exposure data must be available to conduct a risk assessment
- Product Chemistry (new products)
- Confidential Statement of Formula (new products)
- Data Compensation
- Tier I data
- 90 day inhalation (preferred)
- 90 day oral (may extrapolate)
- Applicator/Post Application exposure study



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Efficacy of HVAC&R Products

- Sanitize is a claim to describe the kill of 99.9% of the bacteria on a surface in 5 minutes or less
- Disinfection is a claim to describe the kill of bacteria with complete kill in 59 out of 60 test carriers in 10 minutes
- The Agency does not have an acceptable efficacy method to show that a product can sanitize or disinfect an HVAC&R system
- Data has not been provided to show that any of the products registered for HVAC&R can meet either performance standard
- Our primary concern is that applicators would not be able to provide adequate coverage of all surfaces within an HVAC&R system
- Thus claims should not be made to sanitize or disinfect ductwork



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What about Bleach?

- If using Bleach to control a microorganism, use a registered product which lists that organism on the label
- There are currently no registered Bleach products which include HVAC&R as a use site



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What about paints and coatings?

- If a pesticidal claim is made the product itself must be registered or product must be in compliance with treated article exemption:
“An article or substance treated with, or containing, a pesticide to protect the article or substance itself (...paint treated with pesticide to protect the paint coating...) if the pesticide is registered for such use”
- These are treated article products if claims are limited to protection of the coating (may not state that the duct itself is protected)



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Paints and Coatings

- Antimicrobial component designed to protect the paint film, not the surface of the duct or substrate to which it is applied
- We are not registering treated article products
- If claims beyond the protection of the coating then the article (ductwork) or coating (paint) itself must be registered
- Registration of these products is considered on a case by case basis dependent on active ingredient(s), directions for use, and claims



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How do I know the product is registered for HVAC&R use?

- Description of microbes the product will control and specific efficacy level
- Most products will be bacteriostatic / fungistatic (inhibition)
- HVAC&R directions must be distinctly separate from other directions on the label
- Call Tracy Lantz @ (703) 308-6415 to receive a list of products registered for HVAC&R use.



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HVAC&R Labeling

- Directions placed under a heading such as: Air Ducts, HVAC, or HVAC&R
- Label provides extensive information for a complete HVAC&R program: **inspection**, **correction** of conditions leading to microbial growth & moisture buildup, **cleaning**, and **treatment** with antimicrobial if warranted



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Inspection and Maintenance of HVAC&R System

- Directions as to the proper inspection of an HVAC&R system
- Use of product on HVAC&R systems which are in sound mechanical condition with references to industry guidelines
- Identification of conditions that suggest repair or replacement is necessary
- Correct problem which lead to microbial growth



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Cleaning and Microbial Growth Detection

- Requirement that the HVAC&R system and associated components be cleaned prior to treatment
- Statement that product is only for use in systems where visible mold growth is detected
- Treatment may only take place after removing the growth, identifying and correcting the conditions that lead to the growth



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HVAC&R Components

- Labeling must list the specific HVAC&R components which may be treated
- Examples include: bare metal ducts, flexible ducts, semi porous ducts (plaster or concrete)
- Coating products that meet the treated article exemption may include directions for use on lined ductwork (only protection of the coating)



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Lined Ductwork

- Ducts typically lined with fiberglass which is considered a porous surface
- Concerns regarding the integrity of the fiberglass itself after treatment with liquid (often water based) product
- Absorption of water/moisture by fiberglass may lead to further microbial growth



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Directions for Use

- Detailed description of application equipment, devices or other methods of applying product to HVAC&R surfaces
- Mixing instructions including dilution table
- Application rate for each application method which describes the surface area treated per gallon of use solution



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Directions for Use

- Protective equipment which is required for applicator
- Status of system during treatment or the isolation of a specific section during treatment
- Whether premise is to be vacated (including specifics as to floor/corridor) or occupied during treatment



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Directions for Use

- Frequency of application
- Drying time for product
- When system operations may resume
- Reentry into treated rooms/buildings