

DEPARTMENT: FacilitiGroup	POLICY DESCRIPTION: Environmental – Indoor Air Quality
PAGE: 1 of 3	REPLACES POLICY DATED: 1/12/99, 7/21/99, 11/1/05 (DC.003)
EFFECTIVE DATE: May 1, 2007	REFERENCE NUMBER: ENV.003
APPROVED BY: Ethics and Compliance Policy Committee	

SCOPE: All Company-affiliated facilities including, but not limited to, hospitals, ambulatory surgery centers, outpatient imaging centers, home health agencies, physician practices, and all Corporate Departments, Groups and Divisions and on-site subcontractors.

PURPOSE: To require each facility provide a safe indoor environment for patients, employees and the public by properly maintaining the ventilation and associated systems.

POLICY:

1. Each facility must maintain all ventilation equipment in proper operating condition and be certain that prescribed ventilation rates are adequate to keep the concentration of harmful chemicals, fumes, or odors below the limits for air contaminants set by the **NOISH Pocket Guide (NPG)**. The NPG is available at <http://www.cdc.gov/niosh/npg/npg.html>. A table of typical chemicals found in facilities is attached.
2. Practical control measures must be taken during a construction project to minimize the adverse impact on the indoor air quality for an active health care facility operation.
3. Visual evidence of microbial amplification (mold growth) is indicative of moisture intrusion, water leaks or improper operation of HVAC equipment. Appropriate corrective action must be implemented immediately.
4. Each facility must properly respond to indoor air quality complaints.

Please reference the Indoor Air Quality Checklist for actions required to maintain acceptable indoor air quality standards. The Indoor Air Quality Checklist is attached. This procedure addresses federal regulatory requirements. State and/or local laws or regulations may impose additional requirements. Each facility should consult with Corporate Engineering and Facility Management Department personnel and the facility's Operations Counsel to identify and comply with any additional requirements.

PROCEDURE:

1. Facilities that use solvents or harmful chemicals must maintain an inventory of those chemicals and Material Safety Data Sheets (MSDS) for the products.
2. Any chemical that produces harmful vapor must be handled in a hooded chamber that is equipped with dedicated forced-air ventilation exhausting directly to outdoors. The airflow rate for the chemical hood should be tested, adjusted and properly posted routinely.
3. All facilities should maintain all ventilation equipment in proper operating condition and be certain that the ventilation rates are in compliance with the original designed operating criteria for the building system.

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4. Dust suppression and particulate control must be addressed in construction documents for all corporate and facility construction projects. General contractors for a construction project must be required to implement vapor control methods to ensure that the use of solvents during construction will not affect active operational space.
5. Report observable microbial growth greater than ten square feet to the HCA Risk Management Department. Remediation activities will be designed by consultants approved by the HCA Risk Management Department. Testing for molds will be conducted only if directed by the HCA Risk Management Department.
6. Each facility must have a specific written Indoor Air Quality Management Plan to handle indoor air quality complaints. Each complaint must be responded to adequately and promptly, with the responsive action(s) taken documented properly. Any ambient air testing conducted as a responsive action must be conducted by a qualified laboratory and approved by the HCA Risk Management Department.
7. All facilities must insure that proper air pressure relationships are maintained through out the facility. On an as-needed basis, testing and balancing of the HVAC system must be conducted and documented.

RECORDKEEPING:

If applicable, a compliance file must include:

- Maintenance records of HVAC system;
- Record of IAQ complaints and corrective actions; and
- MSDS sheets.

INDOOR AIR QUALITY (IAQ) CONSULTANTS:

1. All firms providing IAQ services will have a Certified Industrial Hygienist (CIH) certified by the American Board of Industrial Hygiene on staff who is qualified by training and experience to recognize and develop controls for environmental hazards.
2. Firms providing IAQ services must demonstrated a five year history of providing such services to the healthcare industry.
3. Laboratories used for the analysis of samples collected will have the appropriated accreditation for the type of samples being analyzed as determined by the IAQ consulting firm's CIH.

MOLD REMEDIATION CONTRACTOR QUALIFICATIONS:

1. The Mold Remediation Contractor (MRC) selected for remediation of more than ten square feet of mold damaged building materials shall provide proof of satisfactory completion of three similar projects in healthcare facilities.

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2. The MRC shall provide the following documentation for their employees engaged in the work:
 - Proof medically fit to wear a respirator
 - Respirator fit test record
 - Employee release form acknowledging potential hazards of the work
 - Employee mold training (may require state licensing in some states)
 - Business license for the state/local jurisdiction
 - Appropriate insurance for the work
3. The IAQ consultant will evaluate the MRC's qualifications and generate a Letter of Recommendation for approval by the HCA Risk Management Department.

REFERENCES:

29 CFR 1910, Occupational Safety and Health Administration Standards

American Industrial Hygiene Association – Assessment, Remediation and Post – Remediation Verification of Mold in Buildings, AIHA Guideline 3- 2004

New York City Department of Health – Guidelines on Assessment and Remediation of Fungi in Indoor Environments, November 2002

TABLE OF TYPICAL CHEMICALS FOUND IN HEALTHCARE FACILITES

Chemical/Materials Name	Short Term Exposure Limit	Permissible Exposure Limit (TWA)
Xylene	150 ppm* (NIOSH**)	100 ppm
Formaldehyde	2 ppm	0.75 ppm
Formalin	2 ppm	0.75 ppm
Ethylene Oxide	15 ppm (15 min. excursion)	1 ppm
Glutaraldehyde	None	None
Asbestos	1 f/cm ³ *** (30 min. excursion)	0.1 f/cm ³
Lead	N/A	0.050 mg/m ³ ****
Carbon Dioxide	30,000 ppm (NIOSH)	5,000 ppm
Carbon Monoxide	N/A	50 ppm
Nitrous Oxide	N/A	25 ppm (NIOSH)
Halothane	2 ppm (NIOSH 60 minute)	N/A
Chloroform	2 ppm (NIOSH 60 minute)	50 ppm
Enflurane	2 ppm (NIOSH 60 minute)	N/A
Methoxyflurane	2 ppm (NIOSH 60 minute)	N/A
Trichloroethylene	2 ppm (NIOSH 60 minute)	25 ppm (NIOSH)

* ppm = parts per million

** NIOSH = National Institute of Occupational Safety and Health

*** f/cm³ = fibers per cubic meter of air

**** mg/m³ = milligrams per cubic meter of air

The levels in this table should be used in the event that a facility conducts an indoor air quality or industrial hygiene study. The purpose of the short term exposure limit (STEL) is to insure that employees are not exposed to short term high exposures that may cause adverse health effects. The STEL is monitored over a fifteen minute period (or longer if indicated for the chemical), during work practices that would result in peak exposures. The permissible exposure limit (PEL) is an eight hour time weighted average (TWA) concentration that represents conditions under which it is believed that generally all workers may be exposed eight hours a day for a forty hour week over a working lifetime without adverse health effects. Federal OSHA requires that employers do not expose employees to levels above the PEL.

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MAINTENANCE CLEANING SUPPLIES	YES/NO COMMENTS
Are the safest products being used to accomplish the job effectively?	
Are procedures and supplies available for spill control?	
Do chemical and trash storage areas exhaust air to the outdoors?	
Are manufacturers' instructions followed for handling and disposal of maintenance supplies?	
Is work involving odorous or hazardous chemicals scheduled for when the facility is least occupied?	
Are areas ventilated during and after use of odorous and hazardous chemicals?	
DUST CONTROL	<i>Yes/No Comments</i>
Are barrier mats located at all entrances?	
Are the barrier mats vacuumed daily using a beater brush or beater bar vacuum, vacuuming in two directions (in-line and side-to-side)?	
Are micro-filtration bags which retain dust and particles in the 3 micron size range or smaller used in all vacuums?	
Is dusting conducted in a wiping motion with a folded wipe rather than a flicking motion with a crumpled-up wipe?	
Are spots and stains on carpet removed immediately?	
Is excess moisture and cleaning residue removed thoroughly to allow the area to dry quickly?	
PAITENT ROOMS/OFFICES	<i>Yes/No Comments</i>
Are patient rooms/offices dusted and vacuumed thoroughly and daily using micro-filtration bags?	
Is trash removed daily from all patient rooms/offices?	
Is all food removed from patient rooms/offices before the end of the day?	

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Is food stored in tightly sealed containers?	
Is the use of scented cleaners avoided?	
SPILLS	<i>Yes/No Comments</i>
Are spills on carpet cleaned properly and dried within 24 hours?	
Are unit ventilators cleaned and the filters replaced if spilled liquid goes into the unit?	
DRAIN TRAPS	<i>Yes/No Comments</i>
Do all drains have drain traps?	
Is water poured down floor drains once per week (approx. 1 quart of water) to prevent sewer gases from entering these locations?	
Is water poured down the sinks at least once per week (approx. 2 cups of water) to prevent sewer gases from entering the through the drains?	
Are toilets flushed at least once per week?	
EXCESS MOISTURE	<i>Yes/No Comments</i>
Have all indoor surfaces of exterior walls, cold water pipes, windows, window sills, and window frames been checked for condensate?	
Is there vinyl wallpaper applied to exterior walls?	
If so, is there evidence of colored staining or bleeding showing on the paper?	
Has insulation been added to cold surfaces with the potential for condensation?	
Have all patient room lavatories, around and under sinks, ceiling tiles or walls been checked for leaks or signs of moisture from plumbing or roofs?	
Are areas with active leaks repaired promptly?	
Are porous, absorbent building materials or furnishings dried and cleaned according to manufacturers' recommendations within 24 hours?	

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THERMAL COMFORT		<i>Yes/No Comments</i>
Are patient rooms/offices kept between 72 degrees Fahrenheit and 76 degrees Fahrenheit?		
Are patient/rooms/offices drafty or have direct sunlight shining on patients/staff?		
Is the humidity too high (typically if higher than 60% relative humidity, RH) or too low (typically if lower than 30% relative humidity)?		
Are dehumidifiers or desiccants used to dry the air for areas with relative humidity higher than 60%?		
COMBUSTION APPLIANCES		<i>Yes/No Comments</i>
Are all areas free of combustion gas odors?		
Are flue components inspected for leaks, disconnections, and deterioration?		
Are flue components inspected for corrosion and soot?		
Are combustion appliances checked for back-drafting?		
PEST CONTROL		<i>Yes/No Comments</i>
Do you use an Integrated Pest Management (IPM) method of pest control?		
Are outdoor air intakes avoided if pesticides are used outdoors?		
UNEXPLAINED ODORS		<i>Yes/No Comments</i>
Have unexplained odors been checked to determine the source of odors such as but not limited to vehicle exhaust, kitchen/food, "chemical" smell, and mold or mildew?		
LOCAL EXHAUST FANS AND FUME HOODS		<i>Yes/No Comments</i>
Are laboratories and other areas which generate air pollutants equipped with local exhaust fans and/or fume hoods?		
Are the fume hoods and local exhaust fans checked to ensure they function properly?		
Are fume hoods checked to ensure they are not cracked, broken, or pulling away from the ceiling or wall?		

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Are fume hoods checked to ensure they capture respirable particles, gases and vapors released within them?	
Are fans and fume hoods checked to make sure they are not too noisy, therefore discouraging their use during activities which generate air pollutants?	
Are staff and others who use the equipment trained on when and how to use the fume hoods and fans?	
SUPPLIES	<i>Yes/No Comments</i>
Are supplies checked to see whether they are toxic or nontoxic?	
Are appropriate procedures and supplies available for spill control?	
Are all hazardous supplies labeled with the date of receipt/preparation and pertinent precautionary information?	
Are all containers tightly sealed?	
Are recommended procedures followed for disposal of used substances?	
Are compressed gas cylinders secured?	
Are supply storage areas separate and ventilated?	
Are less or non-hazardous materials substituted where possible?	
Are local exhaust fans used?	
Are contaminant-producing activities or operations isolated?	
Are diluted substances rather than concentrates used wherever possible?	
Are fume hoods checked to ensure they capture respirable particles, gases and vapors released within them?	
Are exhaust fans checked to confirm they operate properly?	

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INDUSTRIAL/MAINTENANCE SUPPLIES		<i>Yes/No Comments</i>
Are appropriate procedures and supplies available for spill control?		
Are recommended procedures followed for disposal of used substances?		
Are compressed gas cylinders secured?		
Are supply storage areas separate and ventilated?		
Are exhaust fans checked to confirm they operate properly?		
LOCKER ROOMS		<i>Yes/No Comments</i>
Are shower and other locker room areas cleaned regularly and properly?		
Are chemical cleaners and disinfectants used when areas are unoccupied?		
Are exhaust fans operated to remove moisture and odors?		
Are wet towels removed regularly?		
VENTILATION		<i>Yes/No Comments</i>
An HVAC professional may be needed to assist in some of the following areas.		
If patient rooms/offices have mechanical ventilation, have the air supply vents been checked for airflow?		
If patient rooms/offices have mechanical ventilation, have the air return grills been checked for airflow?		
Are outdoor air intakes unobstructed?		
Have any obstructions of outdoor air intakes been removed?		
Are corrective devices in place if snowdrifts and leaves often block an intake?		
Are outdoor air intakes at ground level clear of nearby pollutant sources (e.g., dumpsters, loading docks, and bus-idling areas)?		

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Are outdoor air intakes at roof level clear of nearby pollutant sources (e.g., plumbing vents and exhaust outlets [such as kitchen, toilet, or laboratory exhaust fans], puddles on the roof, and mist from air-conditioning cooling towers)?	
Where possible, have pollutant sources been removed (e.g., moving a dumpster)?	
Have pollutant sources been separated from the intake (e.g. add another pipe section to raise a nearby exhaust outlet above the intake)?	
Have operating procedures changed, (e.g. turn off vehicles instead of idling at loading docks and bus stands)?	
OFFICE EQUIPMENT	<i>Yes/No Comments</i>
Are printing/duplicating machines checked for leaks and odors?	
Are printing/duplicating machines regularly maintained?	
Are printing/duplicating machines located in a well ventilated area with sufficient outdoor air?	
Are spirit duplicating equipment and diazo dyeline copiers located in a separate room with a fan to exhaust air to the outside?	
KITCHEN	<i>Yes/No Comments</i>
Are exhaust fans used whenever cooking, dishwashing, and cleaning?	
Are exhaust fans checked to ensure that they are functioning properly?	
Is the kitchen inspected for signs of microbiological growth such as moldy odors, slime, and algae?	
Are the upper walls and ceiling checked for evidence of mold growth?	
Are affected areas cleaned as needed?	
If biocides are used, are only EPA registered products used according to manufacturers' instructions?	

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Are food preparation, cooking, and storage areas checked regularly for signs of insects and vermin?	
Are food scraps properly disposed of and crumbs removed?	
Are counters cleaned with soap and water or a disinfectant?	
Are floors swept and mopped to remove food?	
Are stoves and ovens cleaned after use?	
Do waste containers have lids that close securely?	
Is the dumpster located well away from air intake vents, operable windows, and food service doors?	
Are waste containers emptied regularly and frequently?	
Is a sign posted prohibiting vehicles from idling their engines in receiving areas?	
Are doors or air barriers kept closed between the receiving area and the kitchen?	
SYSTEM CLEANLINESS	<i>Yes/No Comments</i>
Are air filters inspected on ventilation equipment?	
Are new filters installed when needed?	
Do the new filters fit properly in their tracks with no major leaks?	
Are new filters installed in the proper direction for airflow?	
Do condensate drain pans slant toward the drain so they do not collect and hold water?	
Are heating and cooling coils clean?	
Are air-handling units (air mixing chambers, coils, and fan blades) and duct interiors clean?	
Is the mechanical room free of trash and chemicals?	

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CONTROLS FOR OUTDOOR AIR SUPPLY		<i>Yes/No Comments</i>
If clocks, timers and seasonal switches are used to control air supply, are they reading the correct time and fit the actual schedule of building use?		
PNEUMATIC CONTROL SYSTEM COMPONENTS		<i>Yes/No Comments</i>
If your system has any pneumatic control system components, are the following maintenance activities conducted?		
Is the line pressure tested at the day and night setting to determine whether the overall system pressure is appropriate?		
Is the line dryer preventing moisture buildup?		
Is the controls system filter changed according to the manufacturer's recommendations?		
Is the line pressure at each thermostat and damper actuator at the proper level allowing no leakage or obstructions?		
Are defective components repaired or replaced?		
OUTDOOR AIR DAMPER		<i>Yes/No Comments</i>
Does the outdoor air damper fully close within a few minutes after turning off the air handler?		
Does the outdoor air damper open at least partially with little or no delay after turning on the air handler?		
Has the freeze-stat condition of the HVAC system been checked?		
Has the mixed air thermostat been checked for heating and cooling mode?		
Has the air economizer setting been checked for proper settings based on design specifications?		
Do the HVAC fans operate continuously during occupied periods to help move air from outdoors to indoors?		
Have air pathways in the original ventilation system design been checked to verify they continue to function?		

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Has the air flow direction in the HVAC system been checked?	
EXHAUST SYSTEMS	<i>Yes/No Comments</i>
Have exhaust fans been checked to confirm they are operating properly?	
Do local exhaust fans remove enough air to eliminate odors and chemical fumes?	
If exhaust air is ducted through the building under positive pressure, is the ductwork sealed and in good condition?	
Has the quantity of outdoor air per person been measured?	
Is enough outdoor air per person available according to the ASHRAE Ventilation Recommendations?	
RENOVATION AND REPAIR	<i>Yes/No Comments</i>
Is a current asbestos management plan on file at the facility?	
Is paint tested for lead before removing old paint?	
If renovating an area with microbial growth, is adequate protection provided for workers and occupants?	
Are patients, visitors, and staff isolated from dust or fumes generated during renovating work by using plastic sheeting, portable fans, or mechanical ventilation?	
Is the effect on ventilation considered while renovating?	
Is adequate time allowed for "off-gassing" before reoccupying an area that has been renovated?	
Is ventilation increased with outdoor air until off-gassing odors and irritation symptoms no longer occur?	
PAINT RENOVATIONS	<i>Yes/No Comments</i>
Are low-VOC emitting paints that are free of lead and mercury selected for new paint jobs?	

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Are exterior paint jobs conducted in such a way so as to minimize infiltration of odors into the building?	
Are interior paint jobs scheduled when the area is unoccupied and time allowed for paint odors to dissipate before occupants return to the area?	
Are supply and exhaust fans used to sweep paint fumes out of the building?	
Are return openings blocked to prevent circulating air into occupied areas?	
Are containers sealed carefully after use?	
Are paint containers stored in designated storage areas equipped with exhaust ventilation, but not in heating, ventilation, and air conditioning equipment rooms?	
FLOOR RENOVATIONS	<i>Yes/No Comments</i>
Has it been determined whether resilient tile flooring scheduled for removal contains asbestos fibers?	
Are low-emitting adhesives used when installing glue-down flooring?	
Are manufacturers' recommendations for ventilation followed in the work area?	
Are low emitting floor materials used for new floor projects?	
Are new flooring products aired out before installation in a well ventilated area?	
Are new floor materials installed when the building is not use?	
Are new flooring materials vacuumed after installation to remove loose matter and particles generated by the installation process and general construction in the area?	
Is there a policy to not install carpet near water sources?	

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Is all hard surface flooring installed near water sources sealed?	
ROOF RENOVATIONS	<i>Yes/No Comments</i>
Is roofing work involving tar or other pollutant-producing chemicals conducted in such a way so as to minimize infiltration of odors into the building?	
Are “hot pots” of tar and other pollutant-producing materials kept away from outdoor air intakes?	
Are doors and windows closed until the roofing work is finished?	