

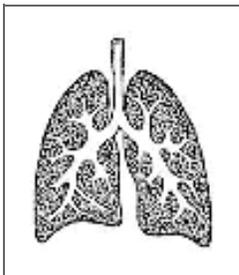


TDCJ Risk Management's Training Circular

Volume 12 Issue 9

Risk Management Issues

September 2012



September

Indoor Air Quality



Texans are constantly seeking to improve the energy efficiency of their homes and workplaces in order to increase comfort and control costs. Installing vapor barriers, insulating walls and ceilings, and placing seals around windows and door-frames have helped a significantly.

These measures allow air-conditioning systems to more easily cool or heat the air in the building. However, they have also greatly decreased the rate of exchange between outdoor and indoor air, sometimes leading to increased levels of particles, chemical compounds and mold indoors.

Scientific studies of indoor air are showing that this increase can cause both short- and long-term health problems for some people. Since we spend about 90 percent of our lives indoors at work and at home, air quality is important.

STATISTICS

EPA (Environmental Protection Agency) studies have shown that the level of many airborne pollutants may be 25 – 100 times higher indoors than outdoors.

OSHA (Occupational Safety and Health Administration) estimates that approximately one out of three Americans who work in nonindustrial buildings, such as schools, offices, and hospitals, are exposed to poor indoor air quality in their workplaces. Statistics show, more than 50 million Americans suffer from allergies, and 15 million Americans suffer from asthma.

Carefully consider and to the extent feasible, accommodate sensitive individuals by:

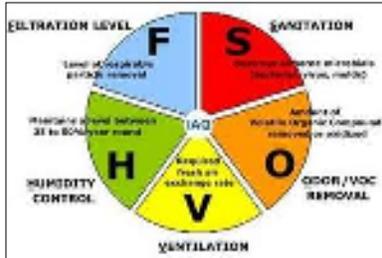
- Locating them away from sources of symptom-triggering substances; or
- Discouraging the use of scented personal care products.

NIOSH (National Institute for Occupational Safety and Health) recently reviewed approximately 500 indoor air quality investigations and found that the primary sources of indoor air quality problems were due to:

- Inadequate ventilation 52%
- Contamination from inside building 16%
- Contamination from outside building 10%
- Microbial contamination 5%
- Contamination from building fabric 4%
- Unknown sources 13%



INDOOR AIR QUALITY FACTORS



Particles

Dust is one of the constant enemies of healthy indoor air. Those particles that are too small to see can cause or increase respiratory problems for many people. Sources of particles include environmental (second hand) tobacco smoke, cooking, candles, tracked-in soil, pet dander, human skin, and copier toner.

Carpets are storehouses and factories of particles. Vacuum and steam clean carpets regularly to keep dust levels down.



Dust mites increase the level of dust by eating matter that is tracked in from outdoors or food particles that fall to the floor.

Other sources of particles in the workplace, especially in the food service and hospital-

ity industry, include candles and cooking.

Scented candles can release up to 60 times more of these particles than unscented candles. Pleasant scent compounds such as limonene (lemon and orange aromas) and pinene (evergreen) are not by themselves harmful, but if they combine with ozone, harmful compounds are produced that are readily absorbed through our lungs.

Replace the ordinary dust filters in the air-conditioning system with High Efficiency Particulate Air (HEPA) filters.

There are many electronic devices that claim to clean the air by making negative ions and ozone. They do make both ozone and negative ions, and they do clean the air. However, that's not the whole story.

First, ozone is a powerful oxidizing agent that is classed as an environmental pollutant rather than a fresh scent.

Second, the negative ions produced by these devices attach themselves to dust, ash, pollen, and smoke particles and cause those particles to bind themselves to the walls and furniture. The air really does become cleaner, but the surfaces become dirtier as a result.

Volatile Organic Compounds (VOCs)

Many common cleaners and deodorizers contain chemical compounds that are safe to be exposed to in small amounts. Some, however, are not harmless. Para-dichlorobenzene (p-DCB) is the deodorizer that makes up the pink cakes that are sometimes used in urinals in public restrooms for men.



According to the Environmental Protection Agency, long-term exposure to high levels of p-DCB has the potential to cause anemia, skin lesions, appetite loss, damage to liver and changes in blood. It is best not to use it in the workplace.

When electronic devices are new, they give off compounds such as toluene and xylene from the paints and adhesives used on subcomponents inside them. Toluene and xylene are suspected cancer-causing agents. It is a good idea to run new TVs, computers, and audio equipment for a period of at least four hours in a well-ventilated area to disperse these VOCs.

Radon

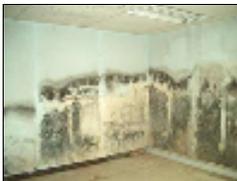
Radon is a radioactive gas that is produced in nature by the decay of uranium ore in the earth. If radon is taken into the lungs it causes damage that may eventually lead to lung cancer.

Soil containing radon is found in all states. In buildings with basements or those built on concrete slabs, radon can be forced through concrete by the pressure of air in the soil and can concentrate in the indoor atmosphere.



People occupying these buildings will be exposed to concentrations that could cause health problems after a period of years. Buildings can be tested for radon. Be sure to contact a reputable testing firm that is licensed by the state.

Molds



Molds are always present in all environments. Like any other living thing, they want to

eat and reproduce. The key to controlling mold is to deprive it of food and/or water, which can be a problem, since one of the favorite foods of mold is wood.

Wooden structures need to be kept dry. This means periodically checking the integrity of the roof, foundation structure and plumbing. Special attention should be paid to the roof membrane after any violent weather event. Does the building have spaces that receive no ventilation, but where moisture levels are elevated?

Silicone caulk is another big favorite food of mold and is used in areas where moisture is often present. Clean it as often as necessary, using bleach or a tile cleaner. If cleaning is put off for too long the mold will penetrate the caulk and the caulk will have to be removed and replaced.

SB 599

Effective December 22, 2002, the Texas Voluntary Indoor Air Quality Guidelines for Government Buildings replaced the Voluntary Indoor Air Quality Guidelines for Public Schools that were in effect from May 10, 1998, through December 21, 2002.

HB 2008

House Bill 2008, passed in the 77th Texas Legislature, 2001, amended the Texas Health and Safety Code, Subtitle C,

Title 5, Chapter 385, to require the Texas Department of State Health Services (DSHS) to establish voluntary guidelines for indoor air quality in government buildings.

EA-05.05

TDCJ also established, within the Facilities Division, Environmental Advisories EA-05.05 Indoor Air Quality to provide recommendations that can prevent or reduce the contamination of indoor air, thereby contributing to a safe, healthy, and productive environment for building occupants.

The following are recommendations from the "Texas Voluntary Indoor Air Quality Guidelines for Government Buildings" for buildings, occupants, good housekeeping and building maintenance in support of good indoor air quality.

Building Occupant Responsibilities

- Keep all areas clean and orderly;
- Air fresheners and scented products (including candles) should not be used;



- Use the least toxic materials (markers, glue, etc.) that will serve the intended purpose;

- Minimize impact of air pollutants by using local exhaust fans or opening windows;
- Keep supply air diffusers and return air grills free and clear of any obstructions, and locate waste containers away from air intakes;
- Do not use mechanical rooms and/or closets housing Heating, Ventilation and Air Conditioning (HVAC) systems for storage;

When correctional facilities consider these guidelines, they must also consider compliance with all of the regulations that may affect their mission to protect the general population by securely housing the criminal offenders of the State.

Security issues or the original structure of earlier facilities may prevent certain ventilation practices from being incorporated into existing facility designs.



Be part of it.

The building owner/operator should prioritize projects based on the criteria above and complete those projects based on hazard concerns and financial ability.

Certain American Correctional Association (ACA) standards, as they relate to environmental conditions, address indoor air quality.

Building occupants should be protected from airborne contaminants that may be disturbed, generated, or released during mitigation and/or renovation, including irritating or toxic substances such as asbestos, lead, pesticides, heavy metals, mold, cement dust, paint vapors, and roof tarring vapors.

REPORTING HAZARDS

Deficiencies as they relate to indoor air quality can be reported through the AD-10.20 Identifying and Reporting Facility Maintenance Requirements for TDCJ owned facilities, or through the TDCJ Office of Space Management (OSM) Tenant Manual for Leased Administrative Office Space

REFERENCES

State Office of Risk Management (SORM) "Maintaining Safe Indoor Air Quality in State Occupied Buildings."

Texas Department of Insurance Division of Workers' Compensation (TDI, DWC) <http://www.tdi.texas.gov/pubs/videoresource/fsindoorairqual.pdf>

Texas Department of State Health Services (TDSHS) <http://www.dshs.state.tx.us/iaq/SchoolsGuide.shtm>

TDCJ Facilities Division Environmental Branch Environmental Advisory EA-05.05 Indoor Air Quality.



Training Circular
TDCJ Risk Management Department
Volume 12 Issue 9
September 2012

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