



Improve the Indoor Air Quality in Your Building



**Environmental
Protection
Department**

The Government of the Hong Kong
Special Administrative Region

This booklet is intended to provide information to help people who work in office buildings or shopping arcades learn about the factors that contribute to indoor air quality and comfort problems and the roles of property managers and occupants in maintaining a good indoor environment. Because good indoor air quality depends on the actions of everyone in the building, a partnership and close coordination between property management and occupants is the best way to maintain a healthy and pleasant indoor environment.



Why is indoor air quality important?

On average, we spend more than 70% of our time at homes, in offices and other indoor environment. Polluted indoor environment may give you headache, itchy eyes, respiratory difficulties, skin irritation, nausea and fatigue. Those with existing respiratory or heart disease are more susceptible to the effects of indoor air pollution. Improved indoor air quality can result in higher productivity, fewer lost work days and better business.

What are the factors that contribute to indoor air quality?

Indoor air quality is a constantly changing interaction of complex factors that affect the types, levels, and importance of pollutants in indoor environments. These factors include: sources of pollutants; design, maintenance and operation of building ventilation systems; temperature and humidity; and occupant perceptions and susceptibilities. In addition, there are many other factors that affect comfort or perception of indoor air quality.

What are the sources of the common indoor air pollutants?

Chemical pollutants — Sources of chemical pollutants include tobacco smoke, ozone from photocopiers, and emissions from other products used in the building (*e.g. office equipment; furniture, wall and floor coverings; and cleaning and consumer products*).

Particles — Particles are solid or liquid substances which are light enough to be suspended in the air. Particles of dust, dirt, or other substances may be drawn into the building from outside and can also be produced by activities that occur in buildings, like sanding wood, printing, copying, operating equipment, and smoking.

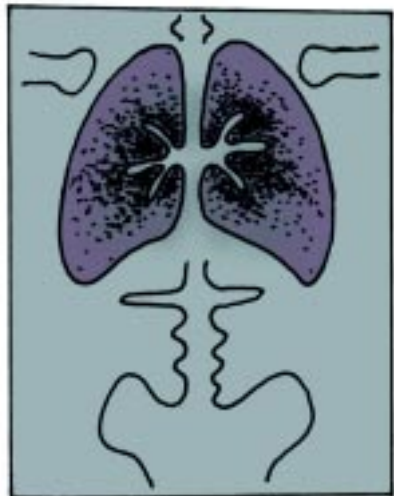
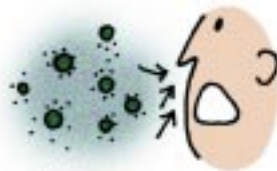
Biological contaminants — Excessive concentrations of bacteria, viruses, fungi (including molds), may result from inadequate maintenance and housekeeping, water spills, inadequate humidity control, condensation, or may be brought into the building by occupants, infiltration, or ventilation air.



What are the health effects of indoor air pollutants?

Many different factors influence how indoor air pollutants affect occupants. Some pollutants, like radon, are of concern because exposure to high levels of the pollutant over long periods of time increases risk of lung cancer. Other contaminants, such as carbon monoxide at very high levels, can cause death within minutes. Some pollutants can cause both short and long term health problems. Prolonged exposure to environmental tobacco smoke can cause lung cancer, and short term exposures can result in irritation and significant respiratory problems for some people, particularly young children.

People can react very differently when exposed to the same contaminants at similar concentrations. For example, some people can develop severe allergic reactions to biological contaminants while other people remain unaffected. Similarly, exposure to very low levels of chemicals may be irritating to some people but not others. For people with asthma or other respiratory diseases, exposure to irritants like environmental tobacco smoke or gases or particles from various indoor sources may cause more severe reactions than the same exposure to others.



How can indoor air quality be improved?

Controlling indoor air quality involves integrating three main strategies. They are:

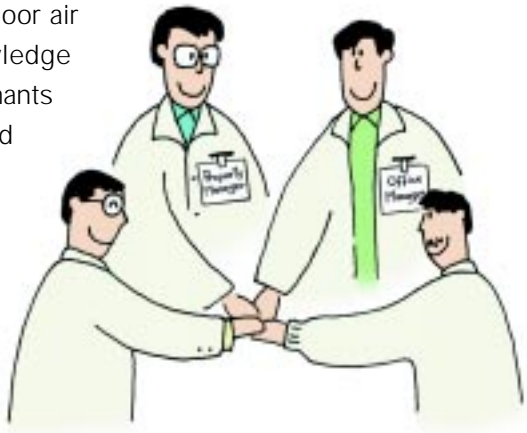
- (a) Manage the sources of pollutants by
 - removing them from the building (*e.g. adopt a no-smoking policy*)
 - isolating them from people (*e.g. relocate photocopiers away from general working area*)
 - controlling the timing of their use (*e.g. re-schedule pest control work outside normal office hours*)
- (b) Dilute pollutants and remove them from the building through ventilation.
- (c) Use filtration to remove the air pollutants.



Why should you share the responsibility to improve indoor air quality?

There are many factors that contribute to poor indoor air quality. This may originate from inadequate design, maintenance and operation of mechanical ventilation and air conditioning (MVAC) system. Some may be solely in the control of the building management, such as maintenance of the MVAC system and the amount of outside air being mechanically brought into the building. Others are largely in the control of building tenants and occupants, such as materials used in renovations and products and furnishings brought into or used in the building by occupants. Some, like cleanliness and general housekeeping of the building, require the cooperation of both the building management as well as all of the individuals who work in the building. For these reasons, improving indoor air quality is a shared responsibility that everyone should contribute.

Although the factors that affect the quality of the indoor environment are numerous, most indoor environmental problems can be prevented or corrected easily and inexpensively through the application of common sense. Success depends on cooperative actions taken by property management and occupants to improve and maintain indoor air quality. With good knowledge about indoor air quality, tenants and occupants are in a good position to help property managers maintain a comfortable and healthy building environment.



What can you do to improve the indoor air quality in your buildings?

All of the occupants of a building can have a great influence on indoor air quality. Everyday activities like heating food in a microwave or using the photocopier can generate odours and pollutants. Being aware of indoor air issues, occupants can help prevent problems. Here are something you can do:

- Do not block air vents or ducts to avoid unbalancing the MVAC system or affecting the ventilation of a neighbouring office. Notify building management if your space is too hot, too cold, stuffy or draughty.
- Do not smoke and advise others to do the same. If really necessary, smoke in designated areas only.

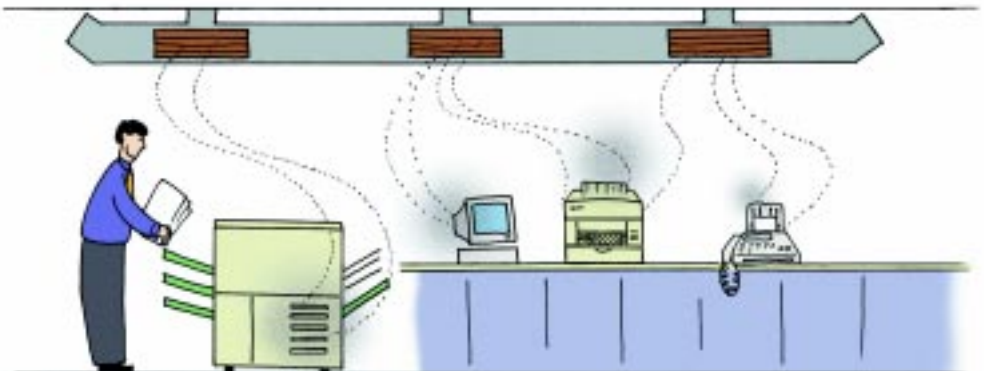


- Clean up all water spills promptly and report water leaks right away to minimise the growth of microorganisms such as molds or fungi.
- Dispose of garbage in appropriate containers to be emptied daily to prevent odours and biological contamination.
- Store perishable food products in fridge to avoid generating unpleasant odours.
- Notify property manager immediately if you suspect an indoor air quality problem and other rubbish-related nuisance. This helps management determine the cause of the problem quickly so that a timely solution can be reached.

What can the office manager do to improve indoor air quality?

If you manage an office or a shopping centre, things that you can do to improve indoor air quality include:

- Cooperate and maintain a good working relationship with building management on indoor environmental issues.
- Make sure supply air vents and return air ducts are not blocked by furniture or equipment. Place computers and heat-generating equipment away from MVAC sensors to avoid inaccurate temperature control.
- Promote a no-smoking policy in the place under your control, and if really necessary, work with the building management to design smoking rooms with independent exhaust which does not allow smoke to circulate through the central ventilation system or to adjoining spaces.
- Provide adequate or separate ventilation to pollutants-generating office equipment such as copiers, printers and fax machines.
- Take into consideration the potential chemical emissions from products and any associated respiratory hazards in your purchasing decision.



- Work with the property manager to ensure use of only necessary and appropriate pest control practices, and non-chemical methods where possible.
- Properly isolate the area to be renovated from other spaces and the MVAC systems, and scheduling these activities for evenings and weekends if possible, to minimise potential occupant problems.
- Try to arrange for plastic wrappings to be removed from partitions, carpet rolls, and other new materials before they are brought into the space. The materials should be aired out in a clean, dry location outside the building for a few days before installation. This can significantly reduce chemical emissions and odours inside the building.



What can property manager do to promote good indoor air quality?

In maintaining a healthy and comfortable indoor environment, things that property manager can do include:

- Appoint an indoor air quality manager, who serves as the contact for indoor environmental issues. The IAQ manager engaged to carry out the assessment of any indoor air quality problems should be a competent person who is adequately experienced and to provide supervision for the management of indoor air quality programme.
- Address any existing and potential indoor air quality problems.
- Arrange a scheduled cleaning and maintenance programme for the MVAC system.
- Make sure fresh air intake is not blocked and is not located in any place where the air is likely to be polluted.
- Educate building staff about indoor air quality management by providing training opportunities.
- Respond quickly to leaks, floods, and other accidents that occur in buildings to prevent indoor air quality problems from developing.
- Manage properly potential pollutant sources such as:
 - smoking
 - renovation materials and furnishings
 - housekeeping and pest control products
- Communicate with tenants and occupants about their roles in maintaining good indoor air quality.
- Establish clear procedures for responding to indoor air-related complaints.
- Keep a record of reported health complaints to aid in solving indoor air-related problems. This will help in making the correct diagnosis and delivering effective treatment.

What can you do if you think your building has an indoor air quality problem?

If you are experiencing health or comfort problems that you suspect to be caused by indoor air pollution, you can:

- Inform the office manager / property manager of your concerns.
- Report your problems to the company health and safety officer, if appropriate.
- Cooperate with management during any indoor air quality investigation to help identify and solve problems.



How can you get more information

There are seven other pamphlets on indoor air quality:

"Indoor Air Quality and You"

"Improving the Indoor Air Quality in Your Home"

"Biological Contaminants and You"

"Environmental Tobacco Smoke and You"

"Formaldehyde and You"

"Radon and You"

"Volatile Organic Compounds and You"



For more information, please contact:

RUJO ENGINEERING
1375, TNHB Main Road,
Velachery, Chennai

phone : +91 9790856540,
+91 7824848440

