

Ozone generators

Ozone generators are being promoted as an effective method to clean indoor air pollution and odours. However ozone is associated with adverse health effects.

Available scientific evidence shows that ozone concentrations that are safe to breathe are unlikely to be effective in controlling indoor air pollution.

Manufacturers and vendors of ozone devices use a variety of terms to describe ozone. Terms such as "energized oxygen" or "pure air" suggest that ozone is a "healthy" kind of oxygen. However, ozone is a toxic gas with very different properties to oxygen. Whether it is a pure form or mixed with other chemicals, ozone can be harmful to health.

Ozone: Good up High, Bad Nearby

Ozone, O₃, is composed of three atoms of oxygen. Two atoms of oxygen form the basic oxygen molecule. The additional third atom makes ozone an unstable, highly reactive gas. The ozone layer in the upper atmosphere helps filter out damaging ultraviolet radiation from the sun, but ozone in the air we breathe is irritative to the eye, nose, throat and lungs and can have a significant negative impact on health.

These proven adverse health effects have resulted in the Australian Government setting standards for ozone in outdoor air.

What does an ozone generator do?

An ozone generator is a device designed to produce the gas ozone. Ozone is used effectively in water purification, but ozone in air must reach high levels to remove air pollutants. Health experts warn that it is important to control conditions to ensure that no person or pet becomes exposed to high levels of ozone. Ozone also masks the odour of some pollutants by impairing a person's sense of smell.

Further, ozone is not effective for killing bacteria or mould in materials such as air conditioning duct lining and ceiling tiles.

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Risks of using ozone generators

Some people are more susceptible than others and may be more likely to experience adverse health effects. People at particular risk are children, the elderly and people with asthma.

Exposure to ozone:

- can cause eye, nose, throat and lung irritation, cough and shortness of breath
- may exacerbate chronic respiratory diseases such as asthma
- is likely to increase hospital admissions and emergency room visits for respiratory disease
- can also adversely affect indoor plants, and damage materials such as rubber, electrical wire coatings, and fabrics.

Studies have found that while some indoor air pollutant concentrations decline in the presence of ozone, other pollutants such as formaldehyde may increase.

Some effective ways to control indoor air pollution

There are several simple and effective methods of controlling indoor air pollution and odours, including source control, ventilation and air cleaning. It is important to note that mould is a common source of odours in homes.

Source control is most effective and easy to implement.

- Remove products and materials, which cause indoor air pollution, or replace with an alternative non-polluting product.
- If no alternative product is available, store the polluting source elsewhere, for example paint thinners are best stored in a detached garage or shed.
- If you can not remove the source, try to reduce its strength. For example, sometimes formaldehyde-emitting materials such as MDF can be sealed to reduce the rate of emission.

Ozone generators fact sheet

- Do not allow people to smoke in your home.
- Routinely clean wet or moist surfaces to prevent mould and bacterial growth.
- Fix plumbing leaks and other water problems as soon as possible and dry all items completely.
- Separate damp areas from living areas and keep bathroom doors closed to reduce humidity in your home. For example vent clothes dryers to outside or locate the washing machine in a separate laundry.

Ventilation is also effective and commonly used.

- Install an exhaust fan close to the source of pollutants or moisture such as the cooking stove, dishwasher and washing machine.
- Keep the windows open as often as possible to allow air to circulate.
- Run the bathroom fan or open the window when showering.

Air cleaning by itself does not adequately reduce indoor air pollution, however it can be used in combination with source control and ventilation.

Air filters, electronic particle air cleaners and ionizers can be used to remove airborne particles. Gas adsorbing material (eg activated charcoal) is sometimes used to remove gaseous pollutants. Air cleaners are relatively costly. To be effective they require proper sizing, installation and use (according to the manufacturers directions), and maintenance, so they are more suitable for use in workplaces rather than homes. Maintenance costs, such as replacement of filters, can be significant.

Importantly, electronic air cleaners such as electrostatic precipitators and ionizers can produce ozone as a by-product.

Further information

US Environmental Protection Agency, Ozone Generators that are Sold as Air Cleaners: An assessment of Effectiveness and Health Consequences.
www.epa.gov/iaq/pubs/ozonegen.html

US Environmental Protection Agency, Ozone-Generating Air Cleaners and Indoor Air Chemistry
www.epa.gov/appcdwww/iemb/ozone.htm

American Lung Association of Washington, Ozone Generators
www.alaw.org/air_quality/indoor_air_quality/ozone_generators.html

Public Works and Government Services Canada, Indoor Air Quality, An Assessment of Ozone Generators
www.pwgsc.gc.ca/realproperty/text/pubs_iaq/ozone-e.html

Health Canada, Health Canada warns the public about air cleaners designed to intentionally generate ozone. (Ozone Generators)
www.hc-sc.gc.ca/ahc-asc/media/advisories-avis/1999/1999_62_e.html

Department of the California Environmental Protection Agency, Air Cleaning Devices for the Home Frequently Asked Questions
www.arb.ca.gov/research/indoor/asdsumm.htm

Sources of Indoor Air Pollution – Improving Indoor Air Quality www.epa.gov/iaq/is-imprv.html

National Environment Protection Measure and Revised Impact Statement for Ambient Air Quality
www.ephc.gov.au/