



HAZARDS IN THE WORKPLACE

FACT SHEET: AIR QUALITY

The following information will tell you what you need to know and what you need to do regarding air quality including air conditioning in the workplace.

The [‘What You Need To Know’](#) Information Sheet sets out why air quality is important, what an atmospheric contaminant is and exposure standards for airborne hazards .

It also has information on air conditioning risks and the law surrounding air quality in the workplace as well as Frequently Asked Questions on air quality.

The [‘What You Need To Do’](#) Information Sheet contains information on employer’s responsibilities, workplace monitoring, solutions regarding airborne contaminants and check lists on managing airborne contaminants and air conditioning system hazards.

These Information Sheets are recommended as a guide only and are not a substitute for professional or legal advice. If you need clarification or further advice please consult your Union for further information.





AIR QUALITY – WHAT YOU NEED TO KNOW

Insert Headings

WHAT IS AIR QUALITY?

The air that we breathe should be free of harmful pollutants including cigarette smoke, chemical fumes, petrol, wood dust, odours and vapours.

The quality of the air you breathe in the workplace is important to your health. It is important that risks associated with things in the air that can harm you, known as atmospheric pollutant are eliminated or reduced to a level that is not harmful.

WHAT IS AN ATMOSPHERIC POLLUTANT?

An Atmospheric Pollutant is:

- A *hazardous substance* that occurs in the form of a fume, mist, gas, dust or vapour (see UnionSafe Information Sheets on hazardous chemicals for more information on this area), or
- An *asphyxiant* (something that chokes you), or
- *Nuisance dust*, to which persons may be exposed in the working environment, or
- *Inspirable dust*, which means those airborne particles of dust that can be breathed in through the nose or mouth (eg asbestos fibres).

Some airborne hazards e.g. gases can reduce the oxygen level and therefore cause death rapidly.

Unconsciousness and DEATH can rapidly occur where oxygen levels are reduced by an asphyxiant e.g. carbon monoxide.

Oxygen can deplete with no obvious warning and most simple asphyxiants are odourless (you can't smell them).

Many simple asphyxiants can also present an explosion hazard and this should be



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taken into account in limiting the concentration of the asphyxiant. The most common asphyxiant is carbon dioxide. It gives no warning of its presence.

AIRBORNE PARTICULATES (DUST)

Airborne particulates are contaminants that can be inhaled directly into the lungs; such as gases, vapours or small particles.

They may exist as dust, fumes, smoke, mist or tiny particles.

The terms 'dust' and 'particulates' are often used to mean the same thing. There are four factors that determine the degree of hazard associated with a specific airborne particulate:

- The type of particulate involved and its biological effect (the effect on the body);
- The concentration of airborne particulates in the area where the worker breathes;
- The size of particles present in the area where the worker breathes; and
- The duration of the exposure (possibly in years).

WHAT DOES THE LAW SAY?

Under **Clause 52 of the OHS Regulation 2001** an employer must make sure that they maintain safe oxygen levels.

Under **Clause 53** an employer must ensure that there are proper ventilation systems such as extraction fans, fumigation cabinets, ducted ventilation systems.

The employer must also ensure that the workplace is kept free from a build up of dust, fibre and other waste material.

VENTILATION SYSTEMS

There are Australian Standards that cover ventilation systems including, air conditioning.....Refer to Australian Standards

For some airborne contaminants there are legal standards setting a limit on the amount



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a worker can be exposed to and the ventilation system should comply with the Australian Standards.

These are set by NSW Government Regulation: *clause 51, subclause (2) of the OHS Regulation 2001.*

INFORMATION ON AIRBORNE HAZARDS (SEE AIRBORNE HAZARDS)

MATERIAL SAFETY DATA SHEETS (MSDS)

Information can be obtained about the airborne hazards in your workplace by a number of means. Firstly the employer must provide Material Safety Data Sheets (MSDS) for every substance that is used in the workplace. These sheets provide information about the health warnings of each substance and the personal protective equipment that should be worn when using the substance.

Material Safety Data Sheets (MSDS) are legally required statements that provide factual information on hazardous substances in addition to that found on the label. Methods to control exposure and exposure standards can also be found in the MSDS.

These MSDS are compulsory and must be supplied by

- The manufacturer
- The supplier, and
- The employer.

If you are working with substances and cannot find the appropriate MSDS contact your union.

An MSDS for a substance provides information on:

- Identification
- Health hazard information
- Precautions for use at application strength, including the exposure standard
- Safe storage and handling information
- All the hazardous ingredients, not just the "active constituent"
- Where a chemical may release another hazardous substance during normal use, such as when reacting with other common materials or when heated
- Emergency procedures



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HEALTH EFFECTS

For most substances in the workplace the main route of entry into the body is through inhalation (breathing it in).

Certain chemical substances such as **aniline**, **nitrobenzene**, **phenols** and **certain pesticides** can readily penetrate intact skin and become absorbed into the body through the skin. Frequently, there will be no accompanying skin damage.

Skin absorption can result from local contamination - for example, from a chemical splashing onto the skin or clothing; or from exposure to very high concentrations of vapour in the air.

Skin absorption can pose a far greater danger than inhalation (breathing in) exposure.

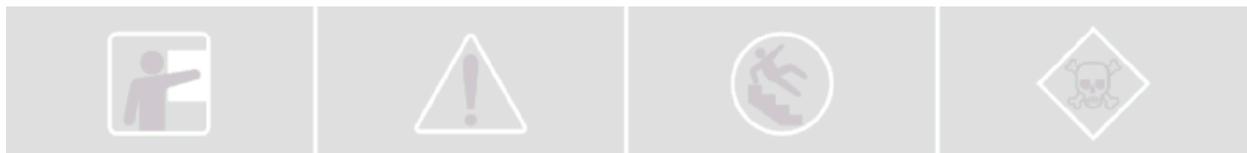
Some substances, such as solvents, can speed up or alter the rate of skin absorption. Serious effects can result with little or no warning, and it is necessary to take special precautions to prevent skin contact when handling these substances.

Carbon dioxide can still have toxic effects at concentrations that are not enough to cause choking.

EXPOSURE STANDARDS AND DURATION

Legally an employer must ensure that no person at a place of work is exposed to an airborne concentration of an atmospheric contaminant that exceeds or breaches a standard referred to in or determined under *clause 51, subclause (2) of the OHS regulation 2001*.

Exposure Standards will be contained in the Material Safety Data Sheet (MSDS) for a substance.



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TIME WEIGHTED AVERAGE (TWA)

Standards are set that are calculated on the basis of the amount of exposure that an employee can be exposed to during an eight-hour working day, five-day working week.

For example, the experts place a monitor on a worker to measure the average time that a worker is exposed to a substance.

For some substances there are *short-term exposure limits*, or where a *peak limitation value* has been assigned (these are explained below), the exposure standards for airborne contaminants are shown as a time-weighted average (TWA) concentration of that substance based on an eight-hour working day, five-day working week.

It is not acceptable to expose workers to concentrations significantly higher than the TWA exposure standard just because the exposure is for less than an eight-hour day or because the exposure occurs only occasionally.

Where workers have a working day longer than eight hours or unusual shift rosters then the TWA exposure standard may need to be adjusted to ensure adequate worker protection.

If no TWA exposure standard is listed then the manufacturer's advice should be followed. It is good general policy to keep exposure to any substance as low as possible, irrespective of whether present information indicates it is hazardous or not.

Some substances previously thought to have been comparatively safe have subsequently been found to pose serious long-term health risks.

SHORT TERM EXPOSURE LIMIT (STEL)

Some substances can cause intolerable irritation or other serious effects upon brief overexposure, although the primary toxic (poisoning) effects may be due to long term exposure through the build up of substances in the body or through repeated exposure.

In these circumstances exposure should be controlled to avoid dangerous health effects.



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Short-term exposure limits (STELs) provide guidelines for the control of short-term exposure

These are an important supplement to the eight-hour TWA exposure standards, which are more concerned with the total intake over long periods of time. Generally, STELs are established to minimise the risk of:

- Intolerable irritation;
- Chronic or irreversible change; and
- Being affected to an extent that could cause industrial accidents (becoming delirious, passing out, etc.).

Provided the TWA exposure standards are not exceeded, STELs are recommended for those substances where there is evidence that adverse health effects can be caused by high short-term exposure.

PEAK LIMITATION

For some rapidly acting substances TWA exposure standards measured over an eight-hour period are inappropriate. These substances may bring on severe effects after relatively brief exposure and so the exposure standard for these substances represents a maximum or peak concentration to which workers may be exposed.

Although it is recognised that there are limitations to the measurement of some substances, compliance with these 'peak limitation' exposure standards should be determined over the shortest practicable period of time, but under no circumstances should a single determination exceed 15 minutes.

ODOUR THRESHOLDS

Many chemical substances have a distinctive odour (smell), which indicates the presence of the substance in the working environment. While this odour perception serves as a useful warning signal, in most instances this perception may convey little information about the potential hazard associated with the atmospheric contaminant.

While a large number of odour thresholds have been determined, there are a number of problems associated with their use. These problems include:



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- The threshold of odour perception varies by magnitude between individuals and among different substances;
- The presence or absence of an odour may not be related to the harmful effects of the substance;
- There may be interference from other substances and smells; and
- A strongly pronounced odour, which is observed on initial contact with the substance, may completely disappear on repeated or continued exposure or change in the concentration (that is, a person may get used to it).

For these reasons odour thresholds should be treated with caution.

The absence of an odour may not indicate a 'safe' environment; conversely, the presence of an odour may not indicate a hazard to health.

Odour perception may be useful as a warning signal, however its use is limited and should not replace the objective measurement of the airborne concentration of the particular substance through workplace monitoring.

HOW WORKPLACES ARE MONITORED

As part of the risk assessment process employers need to measure the concentration of airborne contaminants.

The amount of contaminants may vary considerably at different times and from place to place

Air samples taken at fixed locations in the workplace are only of limited use in assessing the risks posed to workers from a particular contaminant. These samples may be essential in the design of, or assessing the effectiveness of, control measures.

For more information on effective workplace monitoring see the accompanying [Fact Sheet: Air Quality – What You Need To Do](#)

AIR CONDITIONING RISKS

Many workers spend long periods of time indoors in air-conditioned buildings. If the air-



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conditioning system is not maintained a number of problems, some potentially lethal, can occur.

OHS reps have a role to play in ensuring that risks associated with air-conditioning are identified and reduced as much as possible.

A building's air-conditioning system is like the lungs of the building. The air-conditioning system draws in outside air, filters it, heats, cools or humidifies it, circulates it around the building, then expels a portion of it to the outside environment.

The quality of the air many workers breathe at work is totally dependent on the operation of the building's air-conditioning system. Substandard air-conditioning will lead to poor indoor air quality and irritable and potentially very sick workers.

The cost of poor air-conditioning at work is enormous. Studies show that increased sick leave and lower productivity related to poor air-conditioning, costs many millions of dollars each year. The human costs of poor air-conditioning include viral illness, respiratory problems, and the deadly Legionnaires Disease (or Legionella).

Often the cause of breathing and nasal problems is not properly understood; therefore the work related nature is not recognised.

There are three major categories of health problems:

- Lungs and respiratory tract problems e.g. runny nose, blocked nose, coughing, sore throat, sneezing.
- Virus and bacterial reactions e.g. fever, chills, headaches, muscular ache, nausea and vomiting. Diseases include influenza, bronchitis and Legionnaire's Disease.
- Allergic reactions e.g. itchy nose, watering eyes, shortness of breath, wheezing and coughs. Illnesses include sinusitis, asthma and humidifier fever.

To work out whether your workplace has an adequate Air Conditioning system complete the air conditioning checklist found on the accompanying [Fact Sheet: Air Quality – What You Need To Do](#).

FURTHER INFORMATION



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This Fact Sheet is recommended as a guide only and is not a substitute for professional or legal advice. If you need clarification or further advice please consult your Union for further information.

See also UnionSafe fact sheet on Hazardous Chemicals



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AIR QUALITY – WHAT YOU NEED TO DO

WHAT EMPLOYERS MUST DO

Employers must provide information to employees of any airborne hazards in the workplace. This information can be provided through Material Safety Data Sheets.

Employers must also provide employees with Personal Protective Equipment such as glasses, gloves, masks, (For example, enclosed breathing apparatus for workplaces with not be enough oxygen such as Grain Silos).

Employers must also provide employees with Material Safety Data Sheets for every hazardous substance in the workplace.

Employers must also provide adequate ventilation systems including, air conditioning, exhaust and extraction fans, or ducted ventilation systems.

The employer must monitor workplace air quality levels

WHAT YOU SHOULD KNOW

Find out about all the airborne hazards at your work. You should know:

- Their nature,
- Safe exposure levels (if any), and
- Measures to minimise impact
- Obtain Material Safety Data Sheets and Health Warning Sheets
- How they should be used
- If training is required
- What Personal Protective Equipment is required.

This is your right under the law. If you are unsure of any airborne hazards then contact your union or OHS Representative.



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IF YOU ARE EXPOSED TO A HAZARDOUS SUBSTANCE.

- Notify your union and OHS representative immediately
- Ensure that the incident is reported to WorkCover
- Record the incident in the Workplace Injuries Register
- Notify insurance Company
- Complete a Workers Compensation Claim .

(See Accident and Injury Notification Fact Sheet for more information on these processes.)

The Union will organise for referral to an appropriate medical practitioner.

In cases of asbestos you will be referred to the Dust Diseases Board. (See also UnionSafe Fact Sheets on Asbestos and Hazardous Substances.)

CONTROLLING AIRBORNE CONTAMINANTS

There is a checklist below that covers airborne hazards and workplace monitoring and air conditioning below.

The best way of controlling airborne contaminants is by eliminating them from the workplace. Where practicable, chemicals, materials, machines or processes that emit toxic fumes should be eliminated or replaced with safe alternatives.

If this is not possible, airborne contaminants should be removed, preferably by extracting them at the source. If fixed extraction units are not suitable then extraction units are available with flexible ducting that can be manipulated to suit the individual job.

It is the employer's responsibility to maintain a workplace free of hazards, and to provide personal protection where necessary. The employer must be aware of any airborne contaminants that may be produced by chemicals, materials, machines or processes used in the workplace and provide effective Personal Protective Equipment (PPE) where necessary.



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Where a hazard is likely to exist, the employer is responsible for monitoring and controlling the hazard.

Employers must also supply employees with copies of *Material Safety Data Sheets* for any hazardous substance used in the workplace, upon request.

AIRBORNE HAZARDS CHECK LIST

- Create a list of airborne hazards at your work. If you are unsure of any airborne hazards then contact your union or OHS Representative. This is your right under the law.
- Chemicals, materials, machines or processes that emit toxic fumes should be eliminated or replaced with safe alternatives where practicable. The best way of controlling airborne contaminants is by eliminating them from the workplace.
- If airborne contaminants cannot be removed, they are extracted at the source. If fixed extraction units are not suitable then extraction units are available with flexible ducting that can be manipulated to suit the individual job.
- Create a list of safe exposure levels for all airborne hazards and measures taken to minimise impact.
- Provide effective Personal Protective Equipment (PPE) where necessary.
- Employees must be provided with copies of *Material Safety Data Sheets* for any hazardous substance used in the workplace
- Obtain a copy of the UnionSafe *Hazardous Chemicals* Fact Sheet.
- Ensure your workplace is monitored to measure levels of airborne hazards. Where a hazard is likely to exist, the employer is responsible for monitoring and controlling the hazard.



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WORKPLACE MONITORING

To protect the health of workers, exposure measurements should be made from unbiased and representative samples of actual worker exposure.

Special equipment exists to gauge oxygen levels and/or levels of air contamination.

Air samples taken at fixed locations in the workplace are only of limited use in assessing the risks posed to workers from a particular contaminant. These samples may be essential in the design of, or assessing the effectiveness of, control measures.

Proper evaluation of worker exposures may require a substantial commitment of personnel, sampling equipment and analytical resources, along with an appropriate way of measuring the sample.

To protect the health of workers, exposure measurements should be made from unbiased and representative samples of actual worker exposure.

This is a highly technical job and you are not expected to be an expert. For assistance contact your union or the NSW Workers Health Centre who can provide monitoring for your workplace. The NSW Workers Health Centre can be contacted on (02) 9749 7666.

WORKPLACE MONITORING CHECK LIST

- Exposure measurements made from unbiased and representative samples of *actual worker exposure*.
- Air samples taken at fixed locations in the workplace may be used in the design of, or assessing the effectiveness of, control measures. (They are only of limited use in assessing the risks posed to workers from a particular contaminant.)

Union or the NSW Workers Health Centre contacted to provide monitoring for the workplace.



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IMPORTANT INFORMATION FOR OHS REPRESENTATIVES

GUIDANCE MATERIAL: AUSTRALIAN STANDARDS

If you are a safety delegate you and your OHS Committee should obtain the following guidance material from the former National Occupational Health and Safety Commission (NOHSC)

AIRBORNE HAZARDS: HAZARDOUS SUBSTANCES INFORMATION SYSTEM (HSIS):

The Hazardous Substances Information System (HSIS) is an internet database that allows you to find information on hazardous substances.

These are classified in accordance with the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)] 3rd Edition and/or have National Exposure Standards declared under the *NOHSC Adopted National Exposure Standards for Airborne hazards in the Occupational Environment* [NOHSC:1003(1995)] and subsequent updates.

The HSIS provides access to hazardous substance information and the other for exposure standard information.

To check information on hazardous substances visit the HSIS website at <http://www.nohsc.gov.au/applications/hsis/>

ATMOSPHERIC DUST

The following guidance material on atmospheric dust is available for purchase from Standards Australia. Visit their website at <http://www.standards.com.au/catalogue/script/Details.asp?DocN=AS096074267517>
Standards Australia: [Method for sampling a gravimetric determination of inspirable dust.](#)

