



Why is a ventilation system on site necessary?

To remain compliant with Safe Work Australia regulations and their respective approved codes of practice, you must ensure that your workspace is ‘adequately ventilated’ and ‘fresh clean air is drawn from outside the workplace’.¹

An adequate supply of clean fresh air is vital for the health, wellbeing and efficiency of workers in any environment. Without it, workers could be overexposed to dangerous dust and fumes. Not only can this cause short term incapacitation with nausea, dizziness and loss of consciousness, but continuous overexposure can lead to serious long-term health problems such as COPD, Asbestosis and Cancer. Therefore, it is necessary to consider and assess your specific situation and environment, so you can provide a ventilation system that meets the necessary requirements and keeps workers safe.

This best practice guide contains specific advice on how to get the best out of your ventilation control system.

How can you get the best from your ventilation system?



Effective ventilation does not just rely on solution equipment, but on your actions as well. To best ensure the solution equipment can perform to its full potential on site, you can take a proactive approach. Before your project begins, you can break your ventilation process down into stages. This will allow you to effectively assess your environment and identify any problems that may arise over the course of your project. By doing this, you will also be able to identify solutions. In this guide, we have broken the process down into 3 stages:

1. **Before you start**
2. **Setting Up**
3. **During Work**

¹ Managing the work environment and facilities code of practice 2011

Key Ventilation Facts:

- **587,000** people are exposed to harmful dust in the workplace in one year alone in Australia (Cancer Council 2011)
- **5,700** deaths are estimated to be caused in the long term by this exposure per year in Australia (Cancer Council 2011). Symptoms and diagnosis can be immediate or years later.
- **3.6 million** Australians are exposed to cancer causing agents in the workplace each year. (Cancer Council 2017)
- **5,000** new cases of lung cancer are diagnosed each year in Australia as a direct result of workplace exposure with dust and diesel fumes making up the majority of cases (Cancer Council 2017)
- According to Cancer Council's 2017 report, Diesel Engine Exhaust Emissions (DEEEs) cause an estimated **130** deaths, and **over 1.2 million** workers are exposed to DEEEs in Australia.

Below are assessments that you can carry out on your project as well as guidelines that you can follow at each different stage to ensure that you get the best from your ventilation system.

Before you start:

Before works commence on your project, you need to consider the **work area**.

- How big is the work area?
- Are there any hazards within the work area? Is it safe to enter?
- Is there any source of heat? For example, hot water pipes or curing concrete.
- Is there any risk of displacing foul air to a sensitive area (for example into an occupied building?)
- What are my routes of access?
- Is it a confined space?
- Where can I get fresh air?
- Will I need to filter dust or odours from the air before ducting it into the space?

After you have considered these factors, you now need to look at your **work activity**.

- What are you actually doing within the area?
- Will you be using any machinery or equipment?
- Does the activity create any hazards? Dust, fumes, heat or gases?
- How many people will be involved?
- How long will you be in there?

RVT group have specialists who can offer in-depth advice based on over 20 years of experience. They will also provide detailed designs and calculations to back up the suggested solutions.

Setting Up:

A key thing that you need to look at when setting up a temporary ventilation system is the location of the fan. It needs to be close to the area you're ventilating, but away from where it could pick up contaminated air, either from your work area or other processes being carried out nearby. Think about which direction the wind is blowing and place the fan on the upwind (clean) side of your entry point to ensure that air is not recirculated.

You should also be aware of factors such as passing vehicles, diesel powered plant and nearby vents or smoking shelters etc.

Starting from the fan end, run the flexible ducting into the area that you wish to ventilate. When doing this, make sure you keep the duct as short and as straight as possible whilst ensuring that it doesn't create a trip hazard or block emergency routes. The ducts attached to the fan should be tucked inside the next length at joins, to reduce turbulence. Generally, the fresh air should be distributed around the work area as evenly as possible with an emphasis on the parts furthest from widows or other vent points.



RVT's Ventex® 300CF centrifugal fan on site

There are, however, some situations like closed end tunnels or boiler rooms where it is only necessary to duct as far as the work area. This then creates a “bubble” of clean or cool air around the workers. When setting up the ducting, always ensure that the outlets are directed away from dusty surfaces and make sure to keep the area clear when first switching the ventilation system on.



RVT's Ventex® 800CF centrifugal fans on site at a railway tunnel

The 3C's Method



A proven methodology, devised by the RVT Group, to ensure effective control of all on-site health hazards.

Capture the hazard

Extract contaminated air out of the work space.

Contain the hazard

Ensure that the work area remains under pressure as this will help to control air movement (either positive or negative pressure depending on the application).

Control the hazard

Force in clean air to dilute the hazard.

Ventilation by Extraction:

If you have surrounding areas which you wish to protect from contamination, it is possible to use an extraction system to provide ventilation. If you are using this method you must be aware that whereas air delivered by a duct tends to spread and mix with the rest of the air in the room, the effective capture distance of a duct is little more than its diameter so duct placement is critical for effective ventilation.

When using an extraction system, you should have the ducts as far from any openings as possible. Your method statement should specify where the ducts are to be located. Note, in some situations it may be necessary to have the fan running and take ducting with you as you go into an area, effectively taking your fresh air with you. If this is the case, then extra care must be taken to avoid the ducting flapping or snaking as extra lengths are added.



RVT's Ventex® 300m fans extracting hazardous fumes at a railway station

During Work:

When working with a properly installed and set up ventilation system, your key priority is ensuring that nothing changes which could impact the efficiency of the system. For example:

- Has anything been placed near the fan?
- Has any of the ducting been damaged or disconnected?
- Is the ducting still venting in the right location?

As the work progresses it may be necessary to add, remove or relocate ducting to ensure the continued protection and comfort of the workforce.

When works are finished it is simply a case of disconnecting the ducts one by one from the fan, tying them neatly and having the equipment ready for collection.

Codes of practice:

In addition to all the practical steps listed above, it is important to ensure that you meet the ventilation requirements for the applicable code of practice you should be working under.

There are many codes for various applications such as confined space, tunneling and basements, and excavation to name a few. Talk to your RVT Group representative for help to point you to the most appropriate requirements for your particular application.

Examples of our Ventex® Solutions:



Our Ventex® 300P is a compact axial fan, designed to provide powerful ventilation or extraction in situations which have a low power supply. This makes it ideal for ventilating small areas with limited access, and for a range of dust and fume extraction and filtration tasks.

Our Ventex® 300M Centrifugal Fan is particularly suited to extracting hot, flammable or abrasive applications, as the airflow does not pass over the fan's motor. High airflow is maintained even when used with extremely long duct runs (90m +) and/or filtration systems, making this fan ideal for a vast range of ventilation, extraction and filtration tasks.



Our Ventex® 450S is a powerful Centrifugal fan, designed to provide high air flow through long duct runs. This makes it ideal for forced ventilation or extraction from confined areas such as basements, shafts, tunnels and sewers.