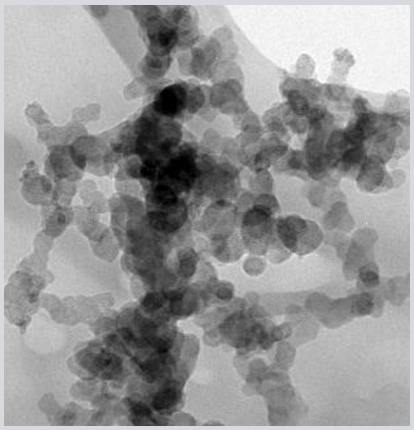
Raising awareness to protect workers' health.
The health risks of diesel fumes

What are these emissions?

Burning diesel fuels creates a mixture of gases, vapours, liquid aerosols and particles. These fumes may contain over 10 times the amount of soot particles than petrol exhaust fumes, and include carcinogenic substances.



AU statistics

- 39% of Australian workers are exposed to airborne hazards in the workplace.
- 23% of workers who reported they were exposed to airborne hazards were not provided with any airborne hazard controls.

Figures are taken from the NHEWS survey.

Safe Work Australia estimates that 1.2 million Australian workers were exposed to diesel exhaust in the workplace in 2011.This is due to the use of diesel vehicles or equipment, such as construction site plant, forklifts, lorries and tractors, and fixed-power sources, including compressors, generators and power plants. So what are the harmful effects of diesel fumes?

Short-term exposure: Irritation to the respiratory system and eyes. Chronic respiratory ill health, eg. coughing and feeling breathless, can seriously affect workers' quality of life.

Long-term exposure: Defined as a Group 1 carcinogen by the International Agency for Research on Cancer. Long term exposure to diesel exhaust fumes is known to cause lung and bladder cancer. Cancer is linked with the particulates in the fumes - ie the soot - which are easily inhaled deep into the lungs and also oxides of sulphur and nitrogen present in the fumes.

The amount of pollution is determined by:

- The type and quality of diesel fuel used (eg. sulphur content)
- The condition and emission grade of the engine
- The working cycle and load on the engine

Legal Responsibility

A person conducting a business or undertaking has the primary duty to ensure, so far as is reasonably practicable, workers and other people are not exposed to health and safety risks arising from the business or undertaking.

This duty includes eliminating exposure to diesel exhaust, so far as is reasonably practicable, for example by using alternative power sources. The duty also includes providing any information, training, instruction or supervision necessary to protect all persons from risk. You can find more information on your legal responsibility here.

RVTGROUP™
Protecting long-term health on site

Image above of a diesel particulate exhaust filter.

Monitoring

If you don't measure it, you can't manage it!

According to The Cancer Council:

"In Australia, diesel engine exhaust is the second most common cancer-causing agent (carcinogen) workers are exposed to, behind ultraviolet radiation exposure."

Therefore, monitoring DPM is vital for protecting workers' health and preventing overexposure to these toxic emissions.

Look for a DPM monitor that is capable of monitoring particles smaller than 0.8 micron (or 800 nanometres), and is able to analyse data in real-time and issue alerts if dangerous levels are exceeded.

Risk assessment

A formal assessment of the hazard is required if any of the following conditions are present:

- Diesel engines or equipment are used in the workplace
- Fumes are released into enclosed or confined spaces
- Fumes are drawn into the workplace via ventilation inlets.
- Fumes are concentrating in areas with limited air movement
- There are soot deposits on surfaces
- Workers suffer from irritated eyes or lungs
- A visible haze can be seen, or there is white, blue or black smoke.

Assessing and managing exposure to harmful substances is a specialist function requiring expert training, knowledge and experience.
A formal assessment could include measuring concentrations of elemental carbon, oxides of sulphur and nitrogen, and also levels of oxygen, carbon dioxide and carbon monoxide.

Key control measures

There are two primary control measures;

1. Capture fumes at source - For mobile plant, install a heavy duty exhaust filter kit directly onto the exhaust; this will remove 95% of diesel particulate before it becomes airborne. Exhaust filter kits are also available for static diesel plant.
2. Use forced ventilation - Force clean air into the work space to dilute and displace airborne contaminants. Correct calculations must be made to determine the correct ventilation strategy. Speak to a fully trained RVT consultant if you require assistance.

Additional controls to consider:

- Replace old engines with newer low-emission models
- Properly maintain engines, especially the fuel-delivery systems
- Ensure engines are turned off when not needed
- If an engine has to be left running, making sure the vehicle or equipment is moved outside
- Ensure cold engines are warmed up in spaces with good ventilation
- Rotate jobs among employees to reduce exposure
- Ensure adequate general ventilation in enclosed workspaces; keep doors and windows open if practical
- Use local exhaust ventilation
- Use connecting extraction pipes for vehicle exhausts in workshops
- Filter air in vehicle cabs
- Use low-sulphur fuel or switch to other forms of fuel if possible

RPE: Use respiratory protective equipment only as a last resort.
In this case, select a filtering face piece (disposable) respirator for particulates.
Face-fit testing and training in the use of this equipment is required.