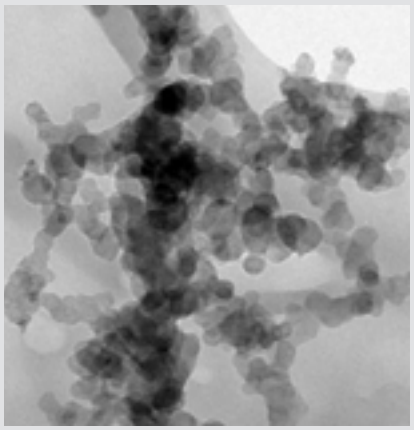
Raising awareness to protect workers' health.

The health risks of diesel fumes

November 2015

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.



Up to 500,000 workers in the UK are exposed to dangerous levels of diesel exhaust fumes each year. 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.

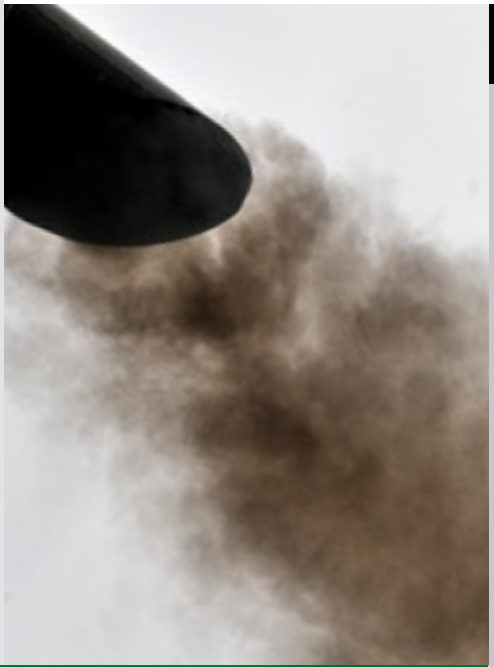
The amount of pollution is determined by:

- 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

UK statistics

- Workers exposed to such emissions are up to 40 per cent more likely to develop lung cancer.
- About 800 people are diagnosed with cancer linked to diesel exhaust fume exposure each year.
- More than 650 people die each year of lung or bladder cancer.

According to the International Agency for Research on Cancer, the Institute of Medicine, and Imperial College London.



What the law says

Diesel fumes are addressed by the following regulations: ***Control of Substances Hazardous to Health; Health and Safety at Work Act; Management of Health and Safety at Work.*** Employers are legally required to assess the risk of people being affected by diesel fumes and prevent or reduce exposure using suitable control measures. There is no exposure limit for diesel exhaust fumes in the EU, but this may change.

Image above of a diesel particulate filter.

Risk assessment

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. An 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 areas
- Fumes are drawn into the workplace via ventilation inlets.
- Fumes are concentrating in confined areas where there's limited air movement
- There are soot deposits on surfaces
- Workers suffer from irritated eyes or lungs
- A visible haze can be seen
- There is white, blue or black smoke

Key control measures

Explain to your colleagues why certain measures are required to protect their health. The following controls are used to reduce or prevent exposure to diesel exhaust fumes:

- **Use forced ventilation to force fresh air into a workspace. Correct calculations must be made to determine the amount of ventilation required. Consult a specialist who can assist with working out what is required**
- Use low-sulpher fuel or switch to other forms of fuel if possible, eg gas or electric
- 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 diesel engine exhausts are fitted with particulate and catalytic filters where possible, by retrofit if necessary
- 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 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.

Essential checks

- Filters on local exhaust ventilation systems – every month.
- Local exhaust ventilation equipment – every 14 months.
- Check whether workers are doing what is required – ongoing.
- Assess risks after implementing control measures. A qualified professional may need to monitor the levels of diesel exhaust fumes. Contact the British Occupational Hygiene Society **(www.bohs.org)** or the Occupational Safety and Health Consultants Register **(www.oshcr.org)**