

# Health risks from exhaust fumes

## Key Points

The fumes from engines, generators and other equipment can be extremely harmful. In some cases, exposure to these fumes can kill within minutes. In other cases, it can lead to longer term ill health conditions like cancer. This document outlines the key risks with using petrol, liquid petroleum gas and diesel powered equipment and what you need to do to manage these. Use safer alternatives where you can.

## Plant and Equipment

Petrol, Liquid Petroleum Gas (LPG) and Diesel are used as a fuel to power many common items of construction plant and equipment. These include:

- Petrol: hand held equipment like cut-off saws and strimmers together with smaller generators to supply electricity.
- LPG: heaters in welfare units, bitumen boilers, drying out structural elements, curing concrete. LPG is also used to power larger items like floor polishers and fork lift trucks.
- Diesel: wheeled vehicles, generators, telehandlers and compressors.

## Health Effects

You need to consider both the immediate and long-term health risks from using equipment powered from any of these sources. The exhaust fumes produced by this plant and equipment can be harmful. The effects can vary from mild irritation to death.

- **Petrol** - Using petrol powered equipment indoors or enclosed spaces with inadequate ventilation, even for a few minutes, can create significant levels of **carbon monoxide** which can **KILL**. Carbon monoxide is a colourless and tasteless poisonous gas which often goes undetected.
- **LPG** – a leakage of LPG could displace air and cause asphyxiation. Skin contact with the fuel can also cause severe cold burns. Significant use of LPG in small, unventilated spaces can also create **FATAL** levels of carbon monoxide.
- **Diesel** – High levels of diesel smoke/soot can irritate the eyes, nose and throat. Due to some of the components within it, regularly breathing in such high levels over long periods is linked to more serious health effects such as cancer. In general, the more smoke/soot you can see the higher the risk.

## Managing the Risk

- **Petrol** – Petrol powered equipment **should never be used indoors or in enclosed spaces** unless the ventilation required for breathing (not just running the machine) has been fully assessed and found to be sufficient. You **should** seek specialist assistance to help you with this assessment. Use safer alternatives – eg. Electrical powered tools. When using petrol powered equipment:
  - Make sure the engines are properly maintained and used
  - Place generators outdoors in a suitable location so that fumes cannot gather or drift into building openings.
  - Consider use of personal or mounted carbon monoxide / oxygen detectors if appropriate.

If there is no alternative to using petrol powered equipment in an enclosed area you **should** seek specialist assistance to help you assess the situation. Specially selected mechanical extraction that vents to the outside will **almost always** be needed.

- **LPG** - The significance of the risk increases the greater the LPG usage / power output of the equipment and the longer it is used for.
  - You must ensure there is adequate ventilation, both at high and low levels.
  - Vents and other ventilation sources in welfare should never be blocked to stop draughts.
  - Ensure open flames are burning cleanly with no spluttering or redness and no signs of soot.
  
- **Diesel** – There should be no additional risk compared to background emission levels to either workers or the public as a result of using operational equipment. However, **AVOID** working in enclosed spaces (inside buildings or in excavations) for long durations near diesel plant/ equipment.
  - Regularly maintain and tune the engines. Look out for black and blue heavy soot. This is a sign of unburnt fuel caused by poor servicing or a mechanical fault with the engine.
  - Buy or hire, equipment with new or properly maintained modern engines.
  - Make sure there is suitable ventilation when working indoors.
  - Limit; a) long periods of engine idling, b) using the engine near to its capacity (unless it is designed for that) and c) stop-go work.
  - Limit the amount of engines / number of people working nearby and the time they are exposed to the fumes.

### Other Risks

You will also have to consider other risks associated with the use of Petrol, LPG and Diesel:

- Fire and explosion
- Confined space work
- Contamination of the ground with spills

### Further Information

More detailed information on the risks outlined above can be found at

- Construction hazardous substances: Carbon Monoxide - <http://www.hse.gov.uk/construction/healthrisks/hazardous-substances/carbon-monoxide.htm>
- LPG – <http://www.hse.gov.uk/gas/lpg/>
- Diesel engine exhaust emissions <http://www.hse.gov.uk/pubns/indg286.pdf>
- Fire risks - <http://www.hse.gov.uk/construction/safetytopics/processfire.htm>

#### REMEMBER:

- **NEVER RUN PETROL POWERED EQUIPMENT INDOORS UNLESS THERE IS ADEQUATE VENTILATION FOR BREATHING**
- **MAINTAIN YOUR EQUIPMENT**
- **TRAIN YOUR STAFF SO THAT THEY KNOW THE RISKS AND KNOW HOW TO USE EQUIPMENT IN A SAFE MANNER**