

Diesel Engine Exhaust Emissions (DEEE)

A panel of experts working for the World Health Organization have confirmed exhaust fumes from diesel engines do cause cancer and concluded that the exhausts were definitely a cause of lung cancer and may also cause tumours in the bladder. The findings were based on research on those working in high-risk industries such as mining, the railway and truck drivers.

The International Agency for Research on Cancer (IARC), a part of the World Health Organization, had previously labelled diesel exhausts as probably carcinogenic to humans.

The **Health and Safety Executive** have produced a document that ranked diesel exhaust fumes as the 6th most important workplace carcinogen. It estimated 652 lung **cancer** and bladder deaths each year from work exposure to diesel exhaust fumes, with over 100,000 people exposed to diesel exhaust fumes at work.

Whilst it is known that lung cancer is caused by multiple factors and that other things such as smoking are far more deadly, the people most at risk are those whose jobs expose them to high levels of diesel exhaust fumes, such as truck drivers, mechanics, or miners. It is thought people working in high-risk industries have about a 40% increased risk of developing lung cancer. The report merits serious attention and action by manufacturers, employers and regulators and those working in environments where diesel exhaust fumes may be present at significant levels.

Research has indicated that the particulate component of the diesel exhaust fume has the potential to cause most harm. The particulate fraction of diesel exhaust fume consists mainly of very small particles which can reach the deep parts of the lungs. When clumped together the particles consist of an irregular stacked graphitic structure referred to as elemental carbon. The graphitic nature and high surface area of these particles means they have the ability to absorb hundreds of organic substances (organic carbon) originating from the unburned fuel, lubricating oils and the compounds formed in the complex chemical reaction during the combustion cycle. The gaseous phase of diesel exhaust consists largely of the same gases found in air, such as nitrogen, oxygen, carbon dioxide and water vapour, and is thus less hazardous.

At present there are no Workplace Exposure Limits for diesel exhaust emissions (DEEEs). However, under the Control of Substances Hazardous to Health regulations (COSHH), DEEEs are classed as a substance hazardous to health and as such it is recommended that employers prevent or reduce workers exposure as much as is reasonably practicable.

When undertaking risk assessments on the exposure to DEEE, simple observations in the workplace may provide a clue to the extent of the exposure at various times. The full assessment of the specific concentration of DEEEs in the workplace is complex and should only be undertaken by trained occupational hygienists.