

Assessing the risk of DEEEs in the workplace

It is important to assess exposure levels of DEEEs as the International Agency for Research in Cancer (IARC) has classified Diesel Engine Exhaust Emissions (DEEEs) as carcinogenic to humans.

DEEEs are a mixture of particulates, gases, and vapors produced during the combustion process of an operating diesel engine.

The major constituents of DEEEs are:

- Nitrogen
- Carbon dioxide
- Water
- Carbon monoxide
- Oxides of nitrogen
- Oxides of sulphur
- Various hydrocarbons
- Alcohols
- Aldehydes
- Ketones
- Particulate
- Polycyclic Aromatic Hydrocarbons

It can be difficult for occupational hygienists to decide which constituent to measure to gain a representative sample to evaluate exposure levels. Sampling for airborne diesel particulate onto a quartz filter with subsequent analysis for **elemental** and **organic carbon** is considered by many as the most appropriate method.

The organic carbon constituent is associated with absorbed organic substances, while the elemental carbon (EC) comes from the soot cores themselves. Samples should be taken using a respirable cyclone sampler such as NIOSH 5040.

Once a diesel particulate is released, it behaves much like a gas and stays airborne for a long time. This makes EC a fair representative for the other gases and vapors associated with DEEEs.

In most workplaces, the only source of airborne EC is from DEEEs. When sampling in a coal mine, the exception to this rule, a size selective sampler called a precision-jeweled impactor needs to be used. This instrument overcomes the problems with distinguishing between the larger EC particles from coal dust and the sub-micron EC particles from diesel.

Marchwood is the only commercial laboratory in the UK which supplies and analyses heat-treated quartz filters for both organic and elemental carbon in line with the thermographic analytical method VDI 2465 using OX/NDIR. The limit of detection (LOD) for organic carbon is 10ug and EC is 2ug.

For more information on Marchwood's services, or to request a quotation, please visit our website or contact us on the details provide below:



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