

Workplace Performance Assessment of Activated Charcoal Filters

Robert Rajan-Sithamparanadarajah

Health and Safety Executive,
Magdalen House, Trinity Road, Bootle L20 3QZ, United Kingdom (UK)
Tel: +44 151 951 3318 Fax: +44 151 951 3595
e-mail: bob.rajan@hse.gsi.gov.uk

ABSTRACT

Organic vapour filters based on activated charcoal are extensively used in the workplace for providing protection against substances hazardous to health present in the air.

Employers have a duty to select and use these filters correctly. Employers in small and medium sized enterprises (SMEs), however, do not possess adequate knowledge and expertise for assessing the effective use time of charcoal filters. The Health and Safety Executive (HSE) have found that in a substantial number of cases charcoal filters have been used for many days or weeks without an assessment being made to establish the effectiveness of these filters to provide adequate protection over such long periods. Current HSE guidance in this area is not helpful to SMEs. HSE consider that further research is needed before any useful guidance can be formulated.

Adsorption capacities and lifetimes were measured for CEN Class A1 and A2 filters for a number of vapours under different conditions such as air flow rates, vapour concentrations, humidity, intermittent exposures and mixtures of vapours. HSE tested filters available from a selected number of manufacturers.

HSE found that the same class of filter obtained from different manufacturers varied in performance and the breakthrough times obtained were a cause for concern. A proportion of filters were found to be defective even though they carried the "CE" marking to indicate that they had been subjected to quality assurance procedures.

This paper will present a summary of the data. On the basis of the data, HSE has formulated simple guidance to SMEs. This guidance does not depend on the use of predictive models and the user will not be expected to assess the useful lifetime of filters. In addition, this guidance will provide a level playing field for suppliers of the filters. Where a filter manufacturer considers that the guidance is too conservative, they are free to provide guidance to their individual customers.