

Title *

Methods to assess diesel engine emission (DEEE) exposure

Abstract *

Introduction

Historic exposure to diesel engine exhaust emissions (DEEEs) is linked to respiratory disease. DEEEs are mixtures including nitrogen monoxide (NO), nitrogen dioxide (NO₂), elemental carbon (EC) and organic carbon (OC). There are no UK exposure limits or agreed biomarkers for DEEE.

Methods

Two garages were visited to investigate potential biomarkers and to assess exposure controls.

Personal exposures to EC, OC, NO, NO₂ were collected. At fixed locations, real time instruments logged NO, NO₂ and black carbon (BC). Urine samples were collected for 5 working days and tested for candidate biomarkers (1-aminopyrene and metallic elements).

Findings

The workplaces were segregated, except for MOT testing, with limited general ventilation. Extraction systems were not widely used.

Airborne exposures for all the substances measured were low. The highest EC concentration was 0.018 mg/m³ and for NO₂ and NO was 0.3 mg/m³. Real time measurements were low, though BC peak measurement was 0.2 mg/m³.

Measured biomarkers were generally within the unexposed population ranges, though some metals were marginally higher.

Conclusion

Based on the measured EC there are exposures to DEEEs; exposures to EC and NO₂ were low.

No suitable biomarkers were identified; further tests for other biomarkers are planned.

Exposures could be reduced by isolation and using ventilation systems.

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