

PPF010: Poster presentation

**Development and Validation of a Method to Evaluate the
Penetration of Diesel Particulate Matter through Respirator Filter
Media, at Flow Rates Representative of Moderate to Heavy Work**

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Abstract

Diesel engine emissions are known to cause adverse health impacts including lung cancer, cardiovascular and irritant effects (World Health Organisation 2012). Respiratory protective devices are commonly used to mitigate worker exposure to many hazardous contaminants. Current standards to evaluate penetration through respirator filter media may not consider ultrafine particles due to the diameter of the challenge aerosol and the detection limit of the instrument. Nor do they test penetration at flow rates representative of moderate to heavy work rates. Research currently underway at the University of Wollongong, Australia, aimed to develop a method to measure penetration through respirator filter media using diesel emissions, rather than the standard challenge aerosol of NaCl, at flow rates consistent with moderate to heavy work rates. The development and validation of the methodology, using a Detroit D706 LTE diesel engine and purpose built experimental chamber to determine penetration by particle number count (25.5 – 560nm), Elemental Carbon and Total Carbon will be described. The design flow rates were as designated in AS/NZS 1716 (Standards Australia International Ltd & Standards New Zealand 2012) and Work Rates 2 and 3 (ISO 2016).