



# Protecting workers against exposure to diesel particulate

*On 12<sup>th</sup> June 2012, the International Agency for Research for Cancer (IARC), which is part of the World Health Organisation (WHO), changed its classification of diesel exhaust from Class 2A (probably carcinogenic to humans) to Class 1 (carcinogenic to humans).*

*This classification was based on sufficient evidence that exposure is associated with an increased risk for lung cancer.*

Diesel engines are widely used to power vehicles and equipment. The exhaust from these engines exposes workers to a complex mixture of airborne contaminants in both gaseous and particulate forms. This mixture can create a respiratory hazard for workers.

There are many gaseous components in diesel exhaust and some of these will be incorporated into the carbon soot particles created in the exhaust. However, the exhaust can also include significant levels of various gas/vapour components. The state of tune of the diesel engine can have a significant effect on the relative makeup of the exhaust - with cold, poorly tuned and worn engines releasing more unburned or partially combusted fuel as well as diesel particulates.

## Health Effects

**Acute:** Symptoms associated with acute/short term exposures include headache, nausea, dizziness, cough, bronchitis, irritation of eyes, nose, throat as well as trigger an asthma attack.

**Chronic:** Potential longer term effects include cardiovascular disease, stroke, high blood pressure, emphysema, lung and bladder cancer.

## Reducing Exposure to Diesel Particulate

Suitable means and methods of reducing worker exposure to the effects of diesel particulate in the work environment have evolved over time. These include improvements in engine technology (catalytic converters), exhaust filters and low sulphur fuels designed to reduce emissions and use of scrubbers to improve air quality and reduce respiratory hazards for workers.

Additionally, the wearing of a P2 rated respirator is an effective means of reducing worker exposure to diesel particulate. The selection of a respirator, cartridge or filter that includes an added carbon layer helps to remove odours associated with unburned fuel and other combustion components of the exhaust which can become breathable organic vapours.

## Importance of Fit Testing

One of the biggest contributors to reduced respiratory protection is poor fit. The AS/NZS1715:2009 Standard states that fit testing is mandatory for all users of tight fitting facepieces - workers who use these should be trained in correct use and maintenance, fit tested and clean shaven. To ensure effective fit of disposable and reusable respirators, 3M has Qualitative Fit Test Kits available.

The use of a tight fitting facepiece should be implemented as part of a comprehensive respiratory protection program as described in AS/NZS1715:2009.



# Suggested 3M™ Respirators that protect against diesel particulate

Following are examples of products and systems offered by 3M that protect against diesel particulate in work environments. It is recommended that you contact your 3M Representative for an assessment of your work area and suggestions on the personal protection solution that most appropriately meets your individual workplace needs.



## 3M™ Cupped Particulate Respirator 8822, P2, Valved

With a P2 rated filter and unique exhalation valve, this respirator is suitable to assist in reducing exposure to diesel particulate in workplace situations. 3M's extensive range also offers respirators with added carbon layer which reduces exposure to odours and unburned fuel vapours.



## 3M™ Half Face Respirator 7500 Series with 3M™ Particulate Filters 2128, GP2

The particulate filter provides P2 protection for diesel particulate and has additional carbon which reduces exposure to odours and unburned fuel vapours produced by poorly tuned diesel engines. 3M have additional half and full face respirators which fit the broad range of cartridges and filters.



## 3M™ Airstream™ Powered Air Purifying Respirator (PAPR)

The Airstream PAPR Helmet is a rugged Australia/New Zealand Standards compliant underground mining respiratory protection system that provides integrated high impact head, eye and face protection.

The versatile helmet offered with optional P2 filter with added carbon for odour removal is suitable for work environments where airborne diesel exhaust fumes may be present.

Please contact, either your 3M Representative or TechAssist Helpline for more information about 3M's comprehensive range of respiratory protection solutions that protect against diesel particulate, odours and unburned fuel vapours.



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