



Frequently asked questions on the workplace exposure standard for diesel particulate matter



1. What is diesel particulate matter (DPM)?

Diesel engine exhaust (DEE) is a complex mixture of gases and particulate matter. The exact nature of DEE depends on a number of factors including the type of engine, how well the plant is maintained, the quality of fuel, engine operating parameters, and installed emission control systems.

DPM is a component of DEE that includes soot particles primarily made up of carbon, ash, metallic particles, sulphates and silicates. Other substances can attach to the particles including organic carbon compounds known as aromatic hydrocarbons.

2. What are the health effects of exposure to DPM?

The International Agency for Research on Cancer (IARC) has classified DEE as a group 1 carcinogen to humans, determining that exposure to DEE increases the risk of lung cancer and possibly bladder cancer. Long term exposure to DPM may lead to serious health effects. Recent research has suggested that ongoing inhalation of the extremely fine (or sub-micron) components of DPM, called nano diesel particulate matter (nDPM), may be responsible for these negative health impacts.

Short term exposure to DPM may cause irritation of the eyes, nose, throat and lungs, in addition inhaling DPM may cause or worsen asthma and allergic reactions.

3. What are workplace exposure standards (WES)?

SafeWork Australia defines a WES as the legal concentration limit of that chemical that must not be exceeded. These limits are published in the Workplace exposure standards for airborne contaminants list.

WES are the airborne concentrations of a chemical that are not expected to cause adverse effects on the health of an exposed worker. However, WES are not intended to represent acceptable exposure levels for workers. They are simply the maximum upper limit prescribed by legislation.

WES do not identify a dividing line between a healthy or unhealthy working environment. Everyone is different, and this means that some people might experience adverse health effects below the exposure standard.

4. Why implement a WES for DPM?

Setting a defined WES for DPM removes uncertainty for both employers and employees of the compliance level required to protect workers' health and safety. A WES for DPM also provides regulators with a clear compliance level, above which enforcement options can be exercised.

5. What is the WES for DPM?

Effective from 5 December 2020, the Government implemented a workplace exposure standard for DPM of 0.1 milligrams per cubic metre (mg/m³) of air.

The WES for DPM must not exceed 0.1 mg/m³ measured as a time-weighted average (TWA) for an eight-hour exposure period.

6. How can exposure limits be adjusted for longer shifts worked?

The Department's *Adjustment of atmospheric contaminant exposure standards – guide* applies to the WA mining industry. This guide requires that a specialised approach called the Québec model is used for the adjustment of exposure standards for extended shifts (>8hrs). Table 4 of the guide provides further information.

7. Why is this important to my workplace?

DPM is a known hazard. Employers are, therefore, required to control exposure levels to as low as practicable. The implementation of a WES may require additional controls and measurements to be implemented.

8. How can exposure to diesel exhaust be controlled?

Various measures can help lower exposure to DPM. Workplaces may investigate the measures that work best in their situation. Some options include:

- replacing diesel engines with electric or other types of power sources
- using low-emission engines
- using exhaust treatment systems such as filters, catalysts and converters, with a corresponding maintenance program
- maintaining engines to optimise performance and efficiency
- maintaining vehicles to ensure exhaust is not leaking into the cab
- designing the work environment to separate people from sources of DPM
- using effective ventilation systems
- using cleaner fuels
- educating and training workers about exposure to diesel exhaust and control measures
- turning off engines when not required
- pre-start inspections of plant to ensure it is fit-for-purpose
- reducing the hours of worker exposure through job rotation and scheduling
- using personal protective equipment, such as respirators.

9. Do I need to measure the level of exposure to DPM?

Yes. Monitoring levels of DPM is a means to verify the effectiveness of controls and levels of employee exposure. Your workplace needs to assess current control measures to ensure workers are protected. If exposures exceed the new WES, you will need to improve control measures to protect workers from potential short and long-term harm and remain compliant with the law.

10. Who can conduct air monitoring?

Air monitoring must be conducted by a competent person, such as an occupational hygienist, the mine's ventilation officer or registered sampler.

11. What if my employer, or someone that I know, is not doing the right thing?

If you think that someone is not doing the right thing to reduce workers' exposure to DPM, it is important to raise the issue as soon as possible with an appropriate manager or supervisor of the business.

If the issue remains unresolved, you can seek assistance from your elected safety and health representative and, where applicable, the safety committee for the business.

If after following these avenues, the matter remains unresolved, you can contact the Department, who may decide to investigate further. Complaints are handled confidentially and the complainant can remain anonymous if they wish.

12. Why is a WES for DPM only being applied to the WA mining industry?

On 12 February 2020, the Mining Industry Advisory Committee (MIAC) recommended implementation of a WES for DPM in the Western Australian mining industry.

The Commission for Occupational Safety and Health will consider whether a WES for DPM is also required in non-mining workplaces, under the Occupational Safety and Health Regulations 1996.

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