

Fine Particulate Matter (PM 2.5)

PM 2.5 is a mixture of solid particles and liquid droplets in the air. Because of its small size, fine particulate matter can be deposited deep in the lungs where it can cause health problems. Recent studies have shown an association between particulate matter and premature mortality from respiratory and cardiovascular disease and increased incidence of respiratory illness particularly in children and the elderly. For adults with heart or lung conditions, exposure to fine particulate matter can cause more illness and in some cases premature death. **More than 90 percent of the particulates found in diesel exhaust are fine particles.**

Diesel exhaust is a [Group 1 carcinogen](#), which causes [lung cancer](#) and has a positive association with [bladder cancer](#). It contains several substances that are also listed individually as human carcinogens by the [IARC](#).

What is Diesel Particulate Matter (DPM)?

- DPM is a component of diesel exhaust (DE) that includes soot particles made up primarily of carbon, ash, metallic abrasion particles, sulphates and silicates.
- Diesel soot particles have a solid core consisting of elemental carbon, with other substances attached to the surface, including organic carbon compounds known as aromatic hydrocarbons.

Health

Impacts of DPM: Associated Toxins

While hundreds of different airborne toxins may be present in the gas phase of diesel exhaust, some of the most commonly identified are **acrolein, acetaldehyde, formaldehyde, benzene, 1,3 butadiene, and polycyclic aromatic hydrocarbons (PAHs).**

Formaldehyde is carcinogenic to humans. It is also a highly reactive substance that can be irritating to the nose, eyes, skin, throat and lungs at fairly low levels of chronic exposure.

Benzene is considered to be carcinogenic to humans. Chronic exposure to benzene leads primarily to disorders of the blood. Butadiene is linked to cancers of the blood and lymph systems, including leukaemia. It has also been linked to disorders of the heart, blood and lungs, and to reproductive and developmental effects.

Some Polycyclic Aromatic Hydrocarbons are carcinogenic to humans. Because this group of compounds covers a wide range of physical chemical properties, some PAH are found in air on particles while others are gaseous. PAH of both forms may be deposited in the lung.

Vulnerable groups who are especially at risk from air pollution include children, pregnant women, and the elderly.

Health Impacts of Diesel Pollution

Diesel-powered vehicles and equipment account for nearly half of all nitrogen oxides (NOx) and more than two-thirds of all particulate matter (PM) emissions from US transportation sources. Particulate matter or soot is created during the incomplete combustion of diesel