

DIESEL EXHAUST

WHAT IS DIESEL EXHAUST?

Diesel exhaust (DE) is a mixture of gases and tiny particles emitted by engines of diesel-powered machines.

The gases and particles in diesel exhaust contain many toxins.

Some toxic chemicals in diesel exhaust gases:

benzene
sulfuric acid
sulfur dioxide
1,3-butadiene
nitrogen oxides
carbon monoxide
polycyclic aromatic hydrocarbons (PAHs)
trace metals (such as cadmium and arsenic)
aldehydes (formaldehyde, acrolein, acetaldehyde)

Diesel exhaust particles are too small to see, and at typical outdoor levels, may not have a distinct odor.

On a street with diesel-powered vehicles, there can be hundreds of thousands of these particles in a cubic inch.

1 inch

Machines that may use diesel:

trucks	maintenance equipment
buses	construction equipment
cars	agricultural equipment
trains	sweepers
tractors	generators

HOW DO I PREVENT EXPOSURE?

WHO IS AT RISK FOR EXPOSURE?

Many people are exposed daily to DE from traffic pollution. However, people who work with vehicles and equipment that use diesel or work near roads, freeways, bus depots, and enclosed, poorly ventilated areas are at an especially high risk for breathing in air contaminated with DE.

EMPLOYERS AND SUPERVISORS SHOULD:

- Replace or retrofit older diesel engines to produce less pollution.
- Implement a regular inspection and maintenance program for diesel engines and ventilation systems.
- Position diesel exhaust away from workers' breathing zones and air intakes, downwind of the worksite.
- Inspect vehicle cabins for cracks or holes and have them repaired or sealed with weather stripping.
- Introduce a no idling policy and adopt methods to reduce idling.
- Prohibit running of diesel engines indoors without vehicle exhaust hoses.
- Computerize delivery systems to reduce mileage.
- For boats, use on-shore alternative power.
- Install CO alarms.
- Reduce employees' time near exhaust when possible.

WORKERS SHOULD:

- Protect skin from direct exposure to diesel soot.
- Follow practical operating procedures such as reduced idling policies.

In New York City, vehicles cannot idle more than 3 minutes, or more than one minute in front of schools.

Occupations at high risk include:

truck and bus drivers
auto maintenance garage workers
bridge and tunnel workers
construction workers
miners
railroad workers
farmers
shipyard workers
taxi drivers
oil and gas workers

TESTING THE AIR

The only workplace air limit for diesel exhaust in the United States is for mines, where the limit is 160 $\mu\text{g}/\text{m}^3$ of total carbon. However, there are workplace limits for some of the gases found in diesel exhaust, such as carbon monoxide, nitric oxide, and nitrogen dioxide.



Air testing can determine your exposure:

- Elemental carbon levels indicate if your exposure is relatively high or low.
- Ultrafine particle counters can identify sources of DE and how well controls work.

Testing the air for DE should be part of your employer's job hazard analysis. The work environment, including ventilation, length and closeness of the work, and your co-workers' symptoms, are clues to your exposure level.

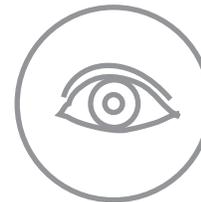
WHAT ARE THE HEALTH EFFECTS OF DIESEL EXHAUST EXPOSURE?

SHORT TERM EXPOSURE

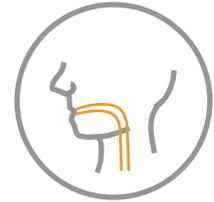
- Irritation of the eyes, throat, and lungs
- Lightheadedness, headaches, fatigue, and nausea
- Respiratory symptoms like coughing and mucus
- Worsening of allergies and triggering of asthma attacks

LONG TERM EXPOSURE

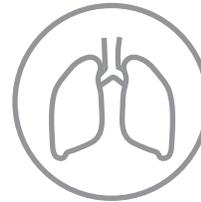
- Chronic cough and mucus, chest tightness and wheezing, decreased lung function
- Worsening of lung diseases such as asthma, emphysema, and chronic bronchitis
- Lung cancer
- Heart disease or worsening of pre-existing heart conditions



Eyes



Throat



Lungs



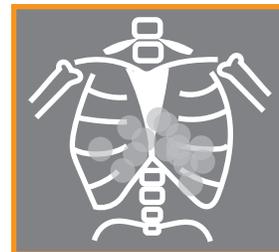
Heart

DE is also suspected to be linked to bladder, larynx, stomach, ovarian, and blood system cancers.

WHAT SHOULD I DO IF I HAVE BEEN EXPOSED?

If you have a sudden high exposure to DE, immediately move away from the exposure site and seek medical attention. Oxygen administration or other treatments may be necessary depending on what is found during your medical exam.

If your work involves regular exposure to DE, you should see a doctor who specializes in occupational medicine even if you are not ill. Regular checkups can catch diseases related to DE exposure early, and an occupational medicine specialist can help determine if any symptoms or illnesses are related to DE exposure.



Your medical exam may consist of checking for signs of heart and lung disease. When you seek medical attention for heavy DE exposure, your medical exam may include a complete physical, a lung function (breathing) test, an electrocardiogram, a chest x-ray, and blood tests.



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