

HAZARD FACTSHEET

DIESEL EXHAUST

What is Diesel Exhaust?

Diesel exhaust is the result of the combustion of diesel fuel. It is a smoky mixture of toxic gases (carbon monoxide, sulfur oxides, nitrogen oxides, acrolein), and other chemicals attached to carbon particles.

What are the Effects of Diesel Exhaust?

When the small particles in diesel exhaust are inhaled deep into the lungs, they can cause damage. Many diseases, such as emphysema, asthma, or heart disease, can be made worse by diesel exhaust.

Many transit workers such as bus drivers, bus fuelers, and bus cleaners are exposed to diesel exhaust as part of their work.

Exposure to diesel exhaust can cause short-term health problems with immediate impact or long-term health problems that will develop over time. Some short-term (or acute) health effects are: irritation of the eyes, nose, and throat;

lightheadedness; heartburn; tightness in the chest; wheezing; vomiting; headache; numbness and tingling in the extremities.

Diesel exhaust can cause chronic health problems. The National Institute for Occupational Safety and Health (NIOSH) considers diesel exhaust a potential human carcinogen (cancer-causing substance). It may take many years after the first exposure for diesel-related cancer and other health impacts to develop.

What Can Be Done To Reduce

Diesel Exhaust?

Substitution

The Occupational Health and Safety Administration (OSHA) requires employers to resolve health and safety problems by first attempting to remove the source of the problem. The best protection against the hazards of diesel exhaust is to eliminate diesel exhaust itself. Many transit systems are replacing diesel engines with engines using cleaner sources of energy including propane, compressed natural gas, and electricity. However, each of these substitutes comes with its own hazards.

Ventilation

If an alternative energy source can't be used, there are still ways to reduce worker exposure. Diesel exhaust in enclosed areas (such as idling, fueling, maintenance and cleaning areas) can be controlled using both local exhaust ventilation and general ventilation.

Local exhaust ventilation is the most effective ventilation system. It removes diesel exhaust before it gets into the air workers breathe. Tail-pipe or stack exhaust hoses should be attached to a vehicle running indoors and exhausted to a place, such as the roof, where it will not re-enter the facility.

General ventilation involves using roof vents, opening doors and windows, roof fans, floor fans, or other mechanical systems to move air through the work area. General ventilation is not as effective as local exhaust ventilation.

Isolate the Worker from the Exhaust

Relocate as many workers as possible away from areas containing diesel exhaust. This will prevent needless exposure for workers not directly involved in operating or maintaining diesel-powered vehicles.

Control operator exposure to diesel exhaust by closing the cab windows when vehicles are running. Air conditioned cabs are critical to providing this safeguard year round. This will limit operator contact with the particles found in diesel exhaust. Diesel gases can still seep into vehicle cabs even when the windows are closed. Preventive maintenance can help reduce exposure to diesel exhaust.

Preventive Maintenance

Following the preventative maintenance practices below can also reduce exposure to diesel exhaust:

- Maintain and tune-up diesel equipment regularly. Check the exhaust system for leaks.
- Fit vehicles with emission control devices (air cleaners), such as collectors, scrubbers, and ceramic particle traps. Regularly check and replace air cleaners when they get dirty.
- Fix cracks in vehicles with weather stripping and repair holes in the floor to prevent exhaust from seeping into a vehicle.

Personal Protective Equipment

Respirators are the least effective method of controlling exposure to diesel exhaust and should only be used as a last resort. NIOSH has not approved respirators that use air cartridges for protection against diesel exhaust. Only a full facepiece, positive pressure, supplied air respirator can provide adequate protection at high concentrations of diesel exhaust. Respirators must be fitted, cleaned, stored, inspected, and maintained in accordance with OSHA's respirator regulation. In addition, workers must be trained on how to use a respirator properly and receive a medical evaluation to assure they are physically fit to wear a respirator.

What are the Legal Requirements and Professional Guidelines for Diesel Exhaust Exposure?

Federal OSHA laws have jurisdiction over private sector workers. Many public sector workers are covered by state OSHA plans. Federal and state OSHA plans both require the inclusion of information on the potential cancer hazards associated with diesel fuel and diesel exhaust on Material Safety Data Sheets (MSDS). Both federal and state OSHA plans also require training in diesel hazards for workers who handle diesel fuel or who may be exposed to diesel exhaust.

Federal and state OSHA plans have permissible exposure limits (PELs) for some components of diesel exhaust, including carbon monoxide, sulfur dioxide, benzene, carbon dioxide, nitrogen dioxide, acrolein, and formaldehyde. OSHA also has a standard on "nuisance" dust that is applicable to the soot in diesel exhaust. As a potential human carcinogen, NIOSH recommends that diesel exhaust exposures be reduced to the lowest feasible limits.



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NTI's Hazard Factsheets provide transit workers and management with information to help recognize and resolve health and safety hazards. NTI offers a variety of other workplace health and safety training and educational resources.