Diesel Exhaust Factsheet for Workers, Unions and Community-Based Organizations

What is Diesel Exhaust?

Diesel exhaust is a smoky mixture of: toxic gases (carbon monoxide, sulfur oxides, nitrogen oxides, acrolein); carbon particles (called particulate matter); and other chemicals (attached to carbon particles). It is produced by incomplete combustion of diesel fuel.

How is Diesel Exhaust Hazardous?

The many small particles in diesel exhaust are readily inhaled and deposited deep into the lung tissue, where they can cause damage. If you have a pre-existing disease, such as emphysema, asthma, or heart disease, it can be aggravated by diesel exhaust.

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 (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.

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

Controls Employers Can Use 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 employers are replacing diesel engines with engines using cleaner sources of energy including propane, compressed natural gas, and electricity.

Ventilation

If an alternative energy source cannot be used, ventilation is the next best way to reduce worker exposure. Diesel exhaust in enclosed areas (such as idling, fueling, maintenance and cleaning areas) should 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 you breathe. Wherever possible, tailpipe 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 reenter the facility.

General ventilation, using mechanical supply and exhaust to move air through the work area, should also be used but is not as effective as local exhaust ventilation. Natural ventilation, using open windows and doors supplemented by floor fans, can also be helpful but is unlikely to be as effective or reliable as proper mechanical ventilation.

Isolation of worker from exhaust

Some workers can be isolated from diesel exhaust. Diesel-powered vehicles should have sealed air-conditioned cabs and should be operated with windows closed.

Safe work practices can also reduce exposure to diesel exhaust

- Whenever possible use the cleanest burning fuel.
- All diesel equipment should have regular maintenance and frequent tune-ups. The exhaust system should be checked for leaks.
- Vehicles should be fitted with emission control devices (air cleaners), such as collectors, scrubbers, and ceramic particle traps. Air cleaners should be checked regularly and replaced when they are dirty.
- Cracks in the vehicle should be fitted with weather stripping to prevent exhaust from seeping in.
- The floor of the vehicle should not have any holes.
- Minimize idling.

Personal protective equipment

Personal protective equipment should used for controlling exposure to diesel exhaust *only if no other controls are possible*.

Respirators are the least effective method of controlling exposure, and should be used only as a last resort.

For diesel exhaust, a combination air-purifying respirator that protects against acid gases, organic vapors, and particulates should be used.

Respirators must be specific to the hazard, and fitted, cleaned, stored, inspected and maintained in accordance with OSHA's respirator regulation.

Workers must be trained, fit-tested, and receive a medical evaluation to ensure they are medically cleared to wear a respirator.

Legal requirements

There is no specific OSHA regulation for diesel exhaust. However, OSHA does have exposure limits for some components of diesel exhaust, including carbon monoxide, sulfur dioxide, benzene, carbon dioxide, nitrogen dioxide, acrolein, and formaldehyde. Federal and state OSHAs have enforceable *permissible exposure limits* (PELs) for those components. OSHA also has a standard on "nuisance" dust that is applicable to soot in diesel exhaust. Because diesel exhaust has been shown to cause cancer, NIOSH recommends that diesel exhaust exposures be reduced to the lowest feasible levels.

Federal and state OSHAs require that the diesel fuel material safety data sheet (MSDS) contain information on the potential cancer hazards associated with diesel fuel and diesel exhaust. 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.