

## Exposure to Diesel Exhaust at the Ports

This factsheet has information about the health effects of diesel exhaust, what employers can do to reduce the exposure at the workplace, and what actions workers can take to support changes in their workplace.

### Diesel Exhaust Overview

**Diesel exhaust** is a dangerous **air contaminant** that can penetrate deep into the lungs. Workers exposed to diesel exhaust can suffer from severe respiratory diseases such as **asthma and lung cancer**. Pre-existing diseases such as allergies, emphysema, or heart disease, can be made worse by diesel exhaust. Diesel exhaust was listed as a potential occupational carcinogen in 1990. The California Occupational Safety and Health Administration (Cal/OSHA) has not established a worker standard for diesel exhaust.

#### *did you know?*

#### Some Toxic Contaminants Found in Diesel Exhaust

- ✓ Carbon monoxide
- ✓ Particulate matter
- ✓ Nitrogen oxides
- ✓ Sulfur dioxide

### Diesel Exhaust and Your Health

#### What is diesel exhaust?

- It is a smoky mixture of thousands of fine particles and gases containing more than **40 chemical carcinogens, including arsenic, benzene, formaldehyde, and nickel**.
- Diesel exhaust is produced when an engine burns diesel fuel.
- The cooling of vapors released from tailpipes results in the formation of particles.

#### How does diesel exhaust affect your health?

- Breathing diesel exhaust can damage lung tissue. **The tiniest of the inhaled particles can stay in the lungs or be absorbed into the bloodstream**, and enter the central nervous system as well as other organs.

#### *did you know?*

#### Diesel Fuel Differs from Diesel Exhaust

Diesel fuel is a liquid combustible pumped into the engine. It is a severe skin irritant that can cause dermatitis.

For more information, see [www.cdc.gov/niosh/ipcsneng/neng1561.html](http://www.cdc.gov/niosh/ipcsneng/neng1561.html)

- Chemicals can attach to the particles to get deep into the lungs. There, they dissolve in the fluid that coats the airways and are absorbed into the body. Recent data has shown that more than 90% of the particles are very small (ultrafine < 0.1 microns) and readily enter body cells. These particles are believed to be more toxic than larger particles and stay in the body for much longer, increasing the exposure time to the toxicants in diesel exhaust.

- The fine and ultrafine particles remain suspended in the air for longer and can travel great distances in the wind.

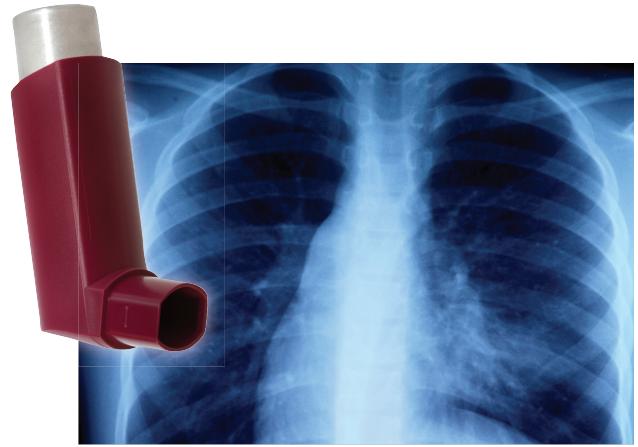


### Short-term (acute) health effects:

- Irritated eyes, nose, throat and lungs
- Cough
- Headache
- Chest tightness
- Feeling “lightheaded”
- Nausea and/or vomiting

### Long-term (chronic) health effects:

- **Diesel exhaust particles increases the risk of lung cancer**, according to scientific studies of long-term exposure. Many studies also show that diesel exhaust particles can cause **cardiovascular (heart) problems**.
- **Other exposures known to cause lung cancer include cigarette smoke and asbestos.** These exposures may interact with diesel exhaust to magnify the risk of lung cancer.
- **Pre-existing diseases such as asthma, emphysema, or heart disease can be made worse by diesel exhaust.** Working or living near freeways or roads is definitely associated with allergic airway disease and asthma.
- Some other effects are **low birth weight and pre-term births; decreased lung function; and premature death in people with heart and lung disease.**



## Who Is at Higher Risk of Exposure?

- Workers in industrial areas such as ports, rail yards, and distribution centers.
- Dockworkers and truck drivers who spend time on or near truck loading and unloading containers at ports, operate or maintain diesel-powered equipment such as forklifts, or work near diesel equipment or near roads and freeways.

## What Can Employers Do to Reduce Diesel Exposure?

- **Replace diesel engines** with engines that use cleaner sources of energy, such as compressed natural gas, electricity, and propane. Eliminating diesel exhaust emissions is the best protection against its hazards.
- **Ensure proper ventilation** in garages, fueling, idling, maintenance, or other enclosed areas to reduce exposures to diesel exhaust. For example, use exhaust extractor hose attachments on the tailpipes of vehicles that must idle for long periods of time in indoor work areas such as vehicle maintenance shops.
- **Provide regular maintenance and frequent tune-ups** to all diesel equipment. Assign workers to check exhaust systems for leaks. Retrofit vehicles with the best available technologies for emissions control.
- **Keep workers as far away as possible from areas containing diesel exhaust** to limit exposure of workers not directly involved in operating or maintaining diesel-powered vehicles. Do not allow workers to run diesel engines near the air intake of building ventilation systems.
- **Be in compliance with idling limits set by the state on port property and at the gates.** It saves fuel, reduces pollution, and limit exposure to unhealthy exhaust. Idling for more than 5 minutes is prohibited within California’s borders. ([www.arb.ca.gov/newsrel/nr100908.htm](http://www.arb.ca.gov/newsrel/nr100908.htm))

## Safe Work Practices for Workers

- Start engines only when necessary and turn them off whenever it's practical. This is the most effective way to reduce exposure to diesel exhaust.
- Maintain engines to ensure that they are functioning properly and emitting as little exhaust as possible.
- Seal cracks or holes with weather stripping to keep exhaust from getting into the cabins of vehicles.
- Use a respirator only if ventilation and other control methods are not effective and feasible. If a respirator is needed, your employer must have a Respiratory Protection Program in place with fit testing and training. (California Code of Regulations, Title 8, Section 5144).

## What Can Be Done at the Ports?

### Mechanics

- Use exhaust extractor hose attachments on tailpipes to carry exhaust outdoors.
- Run engines only when necessary, preferably outdoors.
- Open all windows to get fresh air into the work area and leave doors open in shops.
- Get hands-on training in basic troubleshooting and repair skills in the one-day California Air Resources Board training. (For more information: [www.arb.ca.gov](http://www.arb.ca.gov) or call 1-800-242-4450)
- Check vehicles, equipment, and machinery often to make sure they are not smoking or burning excessive amounts of fuel or oil.



### Hatch Workers

- Switch to electric vehicles where possible.
- Ensure good ventilation in the work area.
- Install exhaust fans and exhaust filtration devices such as exhaust extenders, disposable diesel exhaust paper filters, and catalyzed diesel particulate ceramic filters.
- Do regular maintenance of the intake air cleaner or filter to reduce engine emissions.

### Heavy-Duty Vehicle Drivers and Owners

- Use vehicles that use natural gas, low-sulfur diesel, or other cleaner fuels.
- Use diesel particulate filters to reduce particulate emissions.
- Prepare your vehicle to pass the heavy-duty vehicle inspection program and periodic smoke inspection program, as well as to meet increasingly tough nitrogen oxides and particle emission standards.
- Make sure leased vehicles meet current and upcoming regulations.

## Truck Weighing Stations and Inspection Officers

- Install a fresh-air ventilation system in the booth.
- Increase the distance from the source of the exhaust when possible.
- Have drivers shut off engines rather than idling for very long periods.

## What can workers and union representatives ask employers to do:

- Include information about exposure to diesel exhaust and diesel fuel in the General Safety Plan or Injury and Illness Prevention Program (IIPP). This is a required written document developed by the employer that includes procedures and is put into practice to assure the health and safety of employees while on the job.
- Protect workers who are exposed to diesel exhaust by providing adequate ventilation or protective equipment, such as respirators.
- Request air monitoring to identify and evaluate what work areas and job tasks have high exposure to diesel exhaust.
- Take proper controls to ensure that all vehicles, equipment, and locomotive replacements are the cleanest, most efficient models available to reduce pollution.
- Provide information, instruction, training, and supervision of workers to enable them to work safely, as required by the Occupational Safety and Health Administration (OSHA).

## What Does the Law Say?

- **There is no regulation to limit exposure to diesel exhaust or for the tiny particles that are probably the most important part of diesel exhaust.** However, Cal/OSHA does have workplace exposure limits for some individual components of diesel exhaust.
- Because diesel exhaust may cause cancer, **NIOSH recommends that diesel exhaust exposure be reduced to the lowest feasible amount.**

## What are the legal requirements for diesel exposure in the workplace?

- By law, **employers must provide a safe and healthy workplace** to ensure workers are not exposed to hazards while they are working.
- Under federal and state OSHA regulations, **employers must train workers** who handle diesel fuel or who may be exposed to diesel exhaust about the hazards and how to protect themselves.
- **Employers in California must have an Injury and Illness Prevention Program (IIPP)** to ensure that there is a site-specific plan to identify hazards and take steps to provide all employees with working conditions that are safe and healthy. Exposure to diesel exhaust or diesel fuel must be addressed within this program since there is not a specific standard for diesel exhaust or diesel fuel.

### *did you know?*

#### Permissible Exposure Limits (PELs) for Some Chemicals ([www.dir.ca.gov](http://www.dir.ca.gov))

- ✓ Carbon monoxide  
25ppm
- ✓ Carbon dioxide  
5000ppm
- ✓ Sulfur dioxide  
2ppm
- ✓ Formaldehyde  
0.75ppm

PEL:  
the maximum concentration of air contaminants that are allowed in the workplace.

ppm:  
parts per million, which means one part of contaminant in 1,000,000 parts of air.

## Clean Air Action Plan (CAAP) Facts:

- The ports of Los Angeles and Long Beach adopted the San Pedro Bay Ports CAAP on November 20, 2006.
- **The CAAP provides a comprehensive strategy for reducing air emissions from port operations by nearly 50 percent over a period of five years.** The target pollutants are Diesel Particulate Matter (DPM), Nitrogen Oxides (NO<sub>x</sub>), and Sulfur Oxides (SO<sub>x</sub>).
- Control Measures are operational ways to improve air quality. For example, changing the type of fuel ships use or reducing the speed ships travel can reduce air pollution. Some of the control measures identified in the CAAP are:
  - **Shore power or “Cold ironing” for Ocean-Going Vessels** will enable ships to turn off their diesel engine and connect to electric power when they are docked.
  - **Large Ocean-Going Vessels using low-sulfur fuel** in their auxiliary engines when approaching California coastlines will reduce air emissions.
  - **Vessel Speed Reduction for Ocean-Going Vessels** will minimize the amount of air pollution they produce as they travel to and from shore.
  - **Railroad Locomotives entering port facilities will be 90% controlled** for PM, NO<sub>x</sub>, and idle restrictors by 2011.
- The California Air Resources Board has recently adopted many regulations on sources of pollution related to the movement of goods such as shore power, port trucks, heavy duty on road trucks, harbor craft, cargo handling equipment, etc.



### *did you know?*

#### CAAP Clean Trucks

In November of 2007, the two ports finalized and approved the Clean Truck Program (CTP), which sets environmental standards that call for all port trucks to meet 2007 federal emission standards by 2012, starting with an immediate ban on highly polluting pre-1989 trucks by October of next year.

## Taking Action

### Work with your union to:

- Develop a health and safety committee to work to correct exposure to diesel exhaust and other potential job hazards at the ports.
- Conduct a health survey of the members in order to look for problems related to diesel exhaust exposure and check to see if symptoms are linked to the job.
- Write contract language that will protect workers' rights to clean air, including the use of engineering controls or cleaner technology to eliminate or reduce exposure to diesel exhaust.
- Cooperate with the employer on safety and health matters. If workers are not making any progress with management, they may consider filing a complaint with Cal/OSHA to report a violation.
- Find out about legislative activity related to diesel exhaust and get involved.

## Resources

For more information on diesel exhaust and your rights as a worker, you can contact the following agencies:

- **OSHA (Occupational Safety and Health Administration)**  
(800) 321-OSHA  
  
SAFETY AND HEALTH TOPICS:  
[www.osha.gov/SLTC/dieselexhaust/index.html](http://www.osha.gov/SLTC/dieselexhaust/index.html)
- **Cal/OSHA (California Occupational Safety and Health Administration)**  
(800) 963-9424  
  
HAZARD COMMUNICATION (“RIGHT-TO-KNOW”):  
[www.dir.ca.gov/title8/5194.html](http://www.dir.ca.gov/title8/5194.html)  
  
POWERED INDUSTRIAL TRUCK OPERATOR TRAINING:  
[www.dir.ca.gov/title8/3668.html](http://www.dir.ca.gov/title8/3668.html)  
  
AIRBORNE CONTAMINANTS:  
[www.dir.ca.gov/title8/5155.html](http://www.dir.ca.gov/title8/5155.html)  
  
CAL/OSHA CONSULTATION PROGRAM:  
[www.dir.ca.gov/DOSH/Consultation.html](http://www.dir.ca.gov/DOSH/Consultation.html)
- **HESIS (Hazard Evaluation System and Information Service)**  
(866) 627-1586  
  
PROGRAM TO HELP PREVENT WORKPLACE ILLNESS AND DISEASE:  
[www.cdph.ca.gov/programs/hesis/Pages/default.aspx](http://www.cdph.ca.gov/programs/hesis/Pages/default.aspx)
- **EPA (Environmental Protection Agency)**  
Emergency (800) 424-8802  
  
HEALTH ASSESSMENT DOCUMENT FOR DIESEL ENGINE EXHAUST:  
[www.epa.gov/ttn/atw/dieselfinal.pdf](http://www.epa.gov/ttn/atw/dieselfinal.pdf)
- **NIOSH (National Institute for Occupational Safety and Health)**  
(800) 232-4636  
  
NIOSH HEALTH HAZARD EVALUATION REPORT:  
[www.cdc.gov/niosh/hhe/reports/pdfs/2003-0246-3013.pdf](http://www.cdc.gov/niosh/hhe/reports/pdfs/2003-0246-3013.pdf)

## Others

- **ARB (Air Resources Board)**  
(800) 242-4450  
  
HEALTH EFFECTS OF DIESEL EXHAUST PARTICULATE MATTER:  
[www.arb.ca.gov](http://www.arb.ca.gov)
- **Cal/EPA Office of Environmental Health and Hazard Assessment**  
(916) 323-2514  
  
HEALTH EFFECTS OF DIESEL EXHAUST:  
[www.oehha.ca.gov/public\\_info/facts/dieselfacts.html](http://www.oehha.ca.gov/public_info/facts/dieselfacts.html)  
  
NATIONAL CLEAN DIESEL CAMPAIGN:  
[www.epa.gov/diesel/](http://www.epa.gov/diesel/)
- **NRDC (Natural Resources Defense Council)**  
(212) 727-2700  
  
CLEAN AIR AND ENERGY—HEAVY USE AND HIGH EXPOSURES:  
[www.nrdc.org/air/transportation/ebd/chap1.asp](http://www.nrdc.org/air/transportation/ebd/chap1.asp)  
  
REPORT ON TRUCK DRIVERS’ OCCUPATIONAL EXPOSURE TO DIESEL FUMES:  
[www.nrdc.org/health/effects/driving/driving.pdf](http://www.nrdc.org/health/effects/driving/driving.pdf)
- **NTI (National Transit Institute)**  
(732) 932-1700  
  
DIESEL EXHAUST:  
[www.ntionline.com/Safety.asp](http://www.ntionline.com/Safety.asp)

## Occupational Health Services for Workers

- **UC Irvine** Center for Occupational and Environmental Health: (949) 824-8641
- **UC Los Angeles** Occupational/Environmental Medicine Clinic: (310) 794-8144
- **UC San Diego** Center for Occupational and Environmental Medicine: (619) 471-9210
- **UC San Francisco** Center for Occupational and Environmental Health Clinic: (415) 885-7580
- **UC Davis in Sacramento** Center for Occupational and Environmental Health Clinic: (530) 754-7635

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### UCLA-Labor Occupational Safety and Health Program

Peter Ueberroth Building, 10945 Le Conte Ave, Suite 2107, Los Angeles, CA 90095-1478

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