

APPENDIX B

Harmful Effects of Diesel Exhaust Fumes

A study in early 2005 showed that every year over 20,000 Americans' lives are cut short by exposure to diesel fumes, due to early deaths from lung cancer and heart attacks. The Clean Air Task Force reported that the majority of these deaths could be avoided by using control technologies.

Short-Term Supersensitive Effects

These are warning signs for persons exposed to high concentrations of diesel exhaust. These ill effects are likely to lead to more serious health dilemmas.

- eyes, nose, and throat irritation
- heartburn
- headaches
- tightness in the chest
- weakness, numbness, and tingling in extremities
- wheezing
- vomiting
- light-headedness
- feeling "high"

Long-Term Frequent Recurrence (Chronic)

There are relatively few studies regarding long-term health effects of diesel exhaust. The available studies indicate that diesel exhaust can be very harmful to your health. The United States National Institute for Occupational Safety and Health (NIOSH) human and animal studies show that diesel exhaust should be treated as a human carcinogen (cancer-causing substance). These findings are not surprising, since several substances in diesel exhaust are known to cause cancer. It may take many years from the first exposure for diesel-related cancer to develop.

EPA Reports Diesel Exhaust Linked to Lung Cancer

Long-term exposure to diesel engine exhaust (DE) in the air is linked to lung cancer, the US Environmental Protection Agency (EPA) concluded in a report made public on Sept. 3, 2002.

Studies have suggested that exposure to diesel exhaust fumes increase risks of chronic respiratory symptoms (such as persistent cough and mucous), bronchitis, respiratory system disorders, and reduced lung capacity. The US governmental agency for Toxic Substances and Disease Registry's position states that inhalation of diesel fuel vapors for long periods could damage the kidney and lower a person's ability to clot blood. Diesel exhaust exposure in conjunction with other cancer causing impurities like cigarette smoke, welding fumes and asbestos may increase the risk of developing lung cancer. Persons with preexisting diseases, such as emphysema, asthma, and heart disease, may be more vulnerable to the consequence

of diesel exhaust fumes and soot.

Studies conducted on animals offer evidence of the consequences of diesel exhaust exposure:

- Laboratory animals showed a diminishing level of energy and coordination when exposed to high concentrations of diesel gases.
- When extracts of diesel exhaust were applied to the skin of mice, they developed skin cancer. . Animals' resistance to bacterial infection was reduced by exposure to diesel exhaust.
- Laboratory animals incurred lung injury when exposed to diesel exhaust.

Individual components of diesel exhaust are known to pose a danger; for example, carbon monoxide can stimulate heart diseases and affect coordination. The gaseous phase of diesel exhaust is composed of carbon monoxide and oxides of sulfur, and unburned or partially burned hydrocarbons.

Diesel fume contaminants are also proven in studies to reduce fertility. The particles found in diesel fuel exhaust are extremely small, allowing it to penetrate deep into the human lung "at concentrations above 5 micrograms per cubic meter" according to the EPA. AirMATION® progressive filters can easily capture this airborne diesel particulate matter. In a lifetime, exposure would represent a cancer risk from 1 in 20,000 to 1 in 100.

Diesel Engines vs. Gasoline-Powered Vehicles

Diesel engines emit 50 to 80 times more particulate than gasoline-powered vehicles. These particulate are small and easily inhaled, containing many different chemicals. Fifteen to sixty-five percent of the mass of the particles are comprised of these chemicals, which gather on the surface of the particulate. The balance of the particles is composed of carbonaceous material.

Another group of chemicals found on diesel particulate is poly nuclear aromatic hydrocarbons (PAH), constituting potential health hazards. A tremendous amount of health problems have been associated with diesel engine exhaust fumes, as mentioned above, especially in a confined environment.