

# APPENDIX A

## Composition of Diesel Exhaust Fumes

It's important to first understand the composition of diesel exhaust in addressing their effects and how this toxic substance can be eliminated.

## Components of Diesel Fire Engine Exhaust

More than 60-80% of the indoor air quality contamination from diesel exhaust may be carbon soot/ash, according to the type of engine (injector, standard, turbo, etc.) and the grade of fuel used. Soot adsorbs and spreads the contaminants, and the amount of pollution it creates also depends on several other factors, including turning of the engine, the fuel pump settings, temperature of the engine (age plays an important factor) and the overall maintenance record of the engine.

## Character Class of Diesel Engine Smoke

Diesel fuel exhaust emits three very distinctive types of smoke:

- White smoke, consisting of water droplets and unburned fuel, yields from the cold start of the diesel engine. Most older diesel engines in fire trucks also generate a sharp smell that is irritating to the lungs.
- Black smoke is comprised of soot, oil and unburned fuel, indicating that there is a mechanical issue present.
- Blue smoke comprised primarily oil and unburned fuel, which usually indicates a poorly maintained and/or poorly tuned engine.

## Partial List of Chemicals Associated with Diesel Exhaust

### Major Components

Carbon dioxide  
Carbon monoxide  
Nitric oxide  
Sulfur dioxide  
Particulate

### Minor Components

Acrolein  
O-Anisaldehyde  
Benzene  
2,3-Benzofuran  
Coumarin  
Formaldehyde  
4-Hydroxycoumarin  
m-Hydroxyacetophenone  
2-Hydroxy-4-methoxyacetophenone  
Menadione  
6-Methoxytetralone  
6-Methylcoumarin  
3-Methoxytetralone  
Trimethylbenzene  
Polynuclear aromatic hydrocarbons  
Acenaphthene  
Acenaphthylene  
Anthracene  
Benz (a) anthracene  
Benzo (b) fluoranthene  
Benzo (k) fluoranthene