



---

## **CLEANER GASOLINE FOR CLEANER AIR BETTER FOR YOUR HEALTH**

United States Environmental Protection Agency

The 1990 Clean Air Act requires the Environmental Protection Agency (EPA) to issue regulations that would require gasoline to be "reformulated" so as to result in significant reductions in vehicle emissions of ozone-forming and toxic air pollutants. These regulations were subsequently developed through negotiations with industry, federal and state governments, and environmental and consumer groups, which resulted in cleaner burning gasoline that has significant health benefits. This cleaner gasoline is called reformulated gasoline (RFG). RFG is required to be used in nine major metropolitan areas of the United States with the worst ozone air pollution problems. In addition, several other areas with ozone levels exceeding the public health standard have voluntarily chosen to use RFG.

### **RFG Has Significant Health Benefits**

Gasoline vapors and vehicle exhaust contain volatile organic compounds (VOCs) and oxides of nitrogen (NO<sub>x</sub>) that react in the atmosphere in the presence of sunlight and heat to produce ozone, a major component of smog. Vehicles also release toxic emissions, one of which (benzene) is a known human carcinogen. RFG contains less of the ingredients that contribute to these harmful forms of air pollution. Consequently, RFG reduces the exposure of the U.S. public overall to ozone and certain air toxics.

While ozone in the upper atmosphere ("the ozone layer") occurs naturally and protects life on earth by filtering out the sun's ultraviolet radiation, ozone at ground level, often called smog, is a noxious pollutant, harmful to human health and the environment. Ozone damages sensitive lung tissue, reduces lung function, causes lung inflammation, increases susceptibility to respiratory infection, and increases sensitivity of asthmatics to allergens (e.g., pollen) and other bronchoconstrictors. Symptoms from short-term exposure to ozone include coughing, eye and throat irritation, and chest pain. Long-term health effects from ozone exposure can include accelerated aging of the lungs, reduced elasticity of the lungs, and scarring of lung tissue.

Toxic emissions from motor vehicles have been estimated to account for roughly half of the total exposure of the urban U.S. population to toxic air emissions. A number of adverse



---

non-cancer health effects, such as eye, nose, and throat irritation, have also been associated with exposure to elevated levels of these air toxics.

---

RFG will contain oxygen additives (oxygenates) such as MTBE and ethanol. While oxygenates have been used in some fuels as octane enhancers since the late 1970's, a widespread oxygenated fuel program began in 1992 in 39 urban areas. This program was required by the 1990 Clean Air Act in cities with high carbon monoxide pollution. Oxygenates increase the combustion efficiency of gasoline, thereby reducing vehicle emissions of carbon monoxide. Carbon monoxide enters the bloodstream through the lungs and inhibits the blood's capacity to carry oxygen to organs and tissues. Individuals with chronic heart diseases are particularly sensitive to carbon monoxide exposure. Carbon monoxide can also affect healthy individuals by impairing exercise capacity, visual perception, manual dexterity, learning functions, and ability to perform complex tasks.

Research completed to date suggests that these materials, at levels that exist in reformulated gasoline, pose no greater health risk than the gasoline they are replacing. And, as part of the total cleaner gasoline formulation, they help decrease vehicle emissions. EPA is committed to incorporating the best science in its programs, and will promptly address results of any new research regarding health effects.