# Leaded Fuel Use in General Aviation Aircraft

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## About Port of Portland General Aviation Airports

Hillsboro Airport is a general aviation airport operated by the Port. It supports the regional transportation system by providing general aviation services to businesses and residents. Users include:

- Air ambulances
- Corporate aircraft
- Aircraft charter services
- Television news helicopters
- Flight instruction schools
- Aircraft maintenance and repair operations
- Private aircraft owners
- U.S. Customs and Border Protection

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## General Aviation Aircraft and Air Quality

This fact sheet provides information on the use of leaded fuels at general aviation airports. It also outlines the steps the Port of Portland has taken to transition to new fuels. Community concerns about air quality have led to a national and local focus on this topic.

## Why is there Lead in General Aviation Aircraft Fuel?

Certain types of general aviation aircraft use aviation gasoline, called Avgas, that contains lead as an additive ingredient. It is referred to as 100-octane low-lead fuel (100LL).

Lead is added to Avgas to help boost fuel octane, prevent knock and engine issues that could result in a loss of compression. Compression loss could cause an engine to stop running, impacting flight safety.

Historically, lead was added to a variety of transportation fuels, including motor vehicle gasoline. In 1996, the Environmental Protection Agency completely phased out lead from highway vehicle fuels. This action, in conjunction with tighter controls on other lead sources, such as waste incineration, resulted in average concentrations of lead in air decreasing by 99 percent between 1980 and 2015.

Today, piston-engine aircraft that use Avgas account for about half of the national inventory of lead emitted in the air. When the Federal Aviation Administration approves a replacement fuel for 100LL in 2020, it will remove this airborne source of lead.

## Who Regulates the Amount of Lead Released into the Air?

Lead is a regulated pollutant by the EPA, which has set enforceable standards to limit the concentrations in ambient air to protect human health and the environment. In 2014, the EPA reviewed and maintained a standard of 0.15 micrograms per cubic meter. In addition, Oregon Department of Environmental Quality has established acceptable concentration levels for 52 air pollutants through the Portland Air Toxics Solutions program, adopting the same safe concentration levels as the EPA.

## How is Lead Monitored at Hillsboro Airport?

As part of the ambient air quality standards, EPA requires lead monitoring around airports emitting one ton of lead per year. Based on the most recent Hillsboro Airport emissions inventory, approximately half a ton of lead is emitted at the airport annually and therefore lead monitoring is not required. Approximately 1.2 to 2 grams of lead is in every gallon of Avgas, which accumulates annually to account for the half-ton of lead. It is not all emitted on location; although aircraft fuel at Hillsboro Airport they fly in multiple directions.

## Related Monitoring:

- Locally, according to monitoring data published by DEQ for Hillsboro Hare Field, located a quarter mile from Hillsboro Airport, shows the 2013 annual lead concentration was 0.0030 micrograms per cubic meter, 50 times below ambient benchmark concentrations set by the EPA.
- Regionally, air quality monitoring by DEQ shows declining lead concentrations in the Portland region.
- Since 1994, regular stormwater sampling at Hillsboro Airport shows lead concentrations below allowable DEQ permit benchmarks.

## National Efforts to Remove Lead from Avgas

The FAA established the Fuels Program Office to help meet the agency's goal of making an unleaded fuel that is a "drop-in" replacement for leaded Avgas. This would allow an aircraft that currently uses leaded fuel to safely use unleaded fuel without costly engine alterations. Working with the EPA and key stakeholders on a national level, they plan to replace 100LL fuel by 2020. Although FAA expects national fleet-wide deployment could take up to eight years, the Port has prepared infrastructure at Hillsboro Airport to offer the FAA approved fuel as soon as it is available.

## Port Actions to Support Unleaded Fuel Use at Hillsboro Airport

Many factors influence an airport's capability to switch from leaded to unleaded aviation fuel, including market demand, national regulations and regional availability of alternative fuel sources. The Port does not have the legal authority to restrict or prohibit the sale or usage of 100LL aviation fuels, nor does it have the authority to limit or restrict general aviation aircraft from using the airport.

In response to community concerns, the Port began actions in 2013 to support the transition to new fuels, including:

- Conducting a feasibility study to bring Mogas, ethanol-free automobile gasoline, to Hillsboro Airport. The study showed that 9 to 30 percent of aircraft at HIO could potentially use unleaded Mogas.
- Investing in a fuel storage tank and upgrading its distribution system so that a fuel provider could offer Mogas. The fuel storage tank will work with all fuel grades and types. It is ready to accommodate the new FAA replacement fuel when available.
- Engaging with airport tenants and organizations to understand barriers and opportunities related to unleaded fuel use.
- Maintaining a policy to support new fuel use. The Port has minimum standards for commercial enterprises that do business at Port airports. These minimum standards recognize two different types of fuel that can be used: Jet A (for jets and turboprop aircraft) and Avgas. Current standards allow low-lead and the new unleaded fuel use as soon as it is available.

## Additional Information:

FAA Alternative to Avgas Efforts
https://www.faa.gov/about/initiatives/avgas/

EPA Lead Air Pollution
https://www.epa.gov/lead-air-pollution

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