



Consumer Guide to Ethanol and Flexible-Fuel Vehicles

Ethanol is a domestically produced, agriculturally based fuel. You're likely using it in your car today, perhaps without even knowing it. Ethanol helps improve your car's performance, reduce America's reliance on oil, and can help reduce the cost of powering your vehicle. Here are some useful things to know about ethanol for the next time you're filling up at the pump.



Ethanol History in the United States

When the automotive industry began, many cars ran on ethanol. In the 1970s and early 1980s, oil embargoes, rising oil prices, and growing dependence on imported oil generated a need for fuel alternatives. Since 1985, ethanol use and production increased as government policies and programs began requiring cleaner-burning fuels to reduce the emission of greenhouse gases, such as carbon dioxide, into the atmosphere. In 2019, U.S. consumption of ethanol fuel surpassed 14 billion gallons per year for the first time, resulting in a 133% increase of ethanol use since 2007, as public access and awareness have grown.

What Is Fuel Ethanol?

Ethanol is a renewable fuel made from various plant-based materials collectively known as biomass. In the United States most ethanol is made from corn, but it can be made from other plants with high sugar content, too. Biomass plants are grown, harvested, and transported to production facilities where they are converted to ethanol and then distributed to fueling stations. Most gasoline has some ethanol blended into it. For more information on biomass, see the U.S. Energy Information Administration's website on the basics of ethanol at [eia.gov/energyexplained/biofuels/ethanol.php](https://www.eia.gov/energyexplained/biofuels/ethanol.php).

The most common use of ethanol is as a fuel, which is blended with gasoline. Most of the gasoline sold in the United States contains ethanol. Ethanol adds oxygen to the fuel so the engine burns cleaner, and it increases the octane levels of pure gasoline to improve performance. The amount of ethanol mixed with gasoline may vary by region and season of the year but is usually around 10%. The impact on fuel economy depends on the ethanol content in the fuel and whether an engine is optimized to run on gasoline or ethanol.

DID YOU KNOW?



As the ethanol infrastructure continues to grow, more ethanol blends are readily available to consumers at fueling stations across the nation.

For more information about ethanol fuel infrastructure development, see AFDC's Fuels and Vehicles site afdc.energy.gov/fuels/ethanol_stations.html.



Different Ethanol Blends

U.S. fueling station pumps that dispense gasoline containing ethanol fuel identify the gasoline according to its ethanol content. There are three basic categories, and they are named according to the maximum level of the ethanol blend by volume.

- **E10** is a low-level blend composed of 10% ethanol and 90% gasoline, which is why it is called E-10. E10 is available at nearly every fueling station in the United States. In fact, more than 98% of U.S. gasoline contains up to 10% ethanol to boost octane and meet air-quality standards. If you're filling up at the pump today, chances are the fuel you're putting into your tank is a low-level blend containing 10% or less ethanol. E10 is approved for use in all conventional light-duty vehicles.
- **E15** is a low-level blend composed of 10.5% to 15% ethanol and gasoline. It has a higher-octane rating to improve engine performance, typically costs less than regular unleaded fuel, and is sold at more than 2,000 fueling stations in 30 states. The U.S. Environmental Protection Agency has approved using E15 in vehicles built before 2001 and newer passenger cars, light trucks, and medium-duty vehicles. Check your auto manufacturer's manual for fuel specifications first to ensure you can use E15 in your vehicle.
- **E85** (also called flex fuel) is an ethanol-gasoline blend containing 51% to 83% ethanol, depending on geography and season. E85 can be used in flexible-fuel vehicles (FFVs), which have an internal combustion engine that is designed to run on E85, gasoline, or any blend of gasoline and up to 83% ethanol. E85 is not approved for

use in gasoline-only models. You've likely seen E85 at gas stations throughout the country. Sometimes it's at a stand-alone fuel pump, but you'll often find it at a multi-fuel pump stand. Either way, it is always marked "E85" and has a distinctive yellow handle. While most E85 use in the United States occurs in the Midwest, more than 3,900 public stations in 42 states offer E85. To locate E85 and other ethanol and renewable fueling stations in your area, see the Alternative Fuels Data Center (AFDC) website at afdc.energy.gov/stations#/find/nearest?country=US or download the iPhone or Android app.

Learn how to identify the difference between flex-fuel and gasoline-only vehicles by visiting fuelconomy.gov/feg/flextech.shtml, or use AFDC's Vehicle Search tool afdc.energy.gov/tools to find current FFV models. For more information on ethanol fuel and the proper and safe use of E85 and other ethanol blends, see the AFDC's Ethanol Handling and Use Guide afdc.energy.gov/uploads/publication/ethanol_handbook.pdf.

FURTHER READING

For more information about ethanol fuel infrastructure development, see AFDC's Fuels and Vehicles site afdc.energy.gov/fuels/ethanol_stations.html.