Ethanol Fact Sheet

What is ethanol?

Ethanol is a naturally oxygenated fuel produced by fermenting organic materials such as corn, grains, crop and forestry waste materials. Ethanol is usually blended with gasoline at different levels. E10 is a premium high-octane gasoline for cars and E85 (85% ethanol 15% gasoline) is used as an alternative fuel for light-duty vehicles.

What types of vehicles can use ethanol?

E10 can be used in any gasoline vehicle without modification. E85, however, offers a higher octane rating and must be used in specified vehicles. All major domestic automakers offer E85 compatible vehicles, or flex-fuel vehicles (FFVs), at prices comparable to gasoline vehicles. Refer to list of available FFVs at www.e85fuel.com/index.phpT. According to the National Ethanol Vehicle Coalition there are over four million E85 FFV vehicles on U.S. roads today. Applications for E85 include non-diesel fleet vehicles, buses, light-duty vehicles and delivery trucks.

2008 Model Year Flex-fueled Vehicles (confirm VIN # to ensure E85 capability)

Chevy Avalanche, *5.3L Vortec*	Chrysler Sebring Sedan, 2.7L	Ford F-150, 5.4L	Mercedes C300 Luxury, 3.0L
Chevy Express Vans, *5.3L*	Chrysler Sebring	GMC Savana, *5.3L*	Mercury Grand Marquis, 4.6L
Chevy Impala, *3.5L*	Convertible, 2.7L	GMC Sierra, *5.3L V-8*	Nissan Armada, *5.6L V-8*
Chevy Silverado, *5.3L V-8*	Dodge Grand Caravan, 3.3L	GMC Yukon, *5.3L Vortec*	Nissan Titan, *5.6L V-8*
Chevy Suburban, *5.3L Vortec*	Dodge Dakota, 4.7L	Jeep Commander, 4.7L	Pontiac Montana, *3.9L*
Chevy Tahoe, *5.3L Vortec*	Dodge Durango, 4.7L	Jeep Grand Cherokee, 4.7L	
Chevy Uplander, 3.9*L*	Dodge Ram 1500, 4.7L	Mercedes C300 Sport, 3.0L	
Chrysler Aspen, 4.7L	Ford Crown Victoria, *4.6L*		

How does ethanol perform?

Vehicles operating on E10 achieve the performance and range expected from a premium fuel. Vehicles running on E85 will have a shorter range than gasoline vehicles because a gallon of ethanol has as much as 29% less energy content than a gallon of gasoline. However, ethanol has a higher octane rating than regular unleaded gasoline making E85 a premium fuel. Another benefit of FFVs, which can run on either E85 or gasoline, is that they allow vehicle operators the ability to obtain fuel in areas where E85 is not available. Because of the differences between ethanol and gasoline, FFVs have special fuel lines, hoses, gas tanks, valves and gaskets. E85 content may be lowered to 70% in severe cold weather conditions to avoid cold start problems. E10 and E85 burn more completely and at a cooler temperature than gasoline, resulting in fewer combustion deposits and longer spark plug life. E85 is very different from gasoline and distributors should review the DOE's Handbook for Handling, Storing, and Dispensing E85 (www.eere.energy.gov/afdc/pdfs/40243.pdf).

What are the benefits of using ethanol?

Vehicles running on ethanol fuels emit less carbon monoxide and other toxic chemicals, such as benzene, than those running on gasoline. They also emit the same or lower levels of hydrocarbon and non-methane hydrocarbons. E85 has fewer highly volatile chemicals than gasoline, resulting in fewer evaporative emissions.

Emissions reductions achieved by E85 as compared to petroleum gasoline.

Source: ***Environmental Protection Agency***

Carbon Monoxide	40%
Volatile Organic Compounds	15%
Nitrogen Oxides	10%
Particulate Matter	20%

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E10 however, may result in greater evaporative emissions. Ethanol blended fuels derived from grain will result in lower life-cycle carbon dioxide emissions because it is derived from plant material which absorb carbon dioxide as it grows. A study by the Argonne National Lab concluded that E85 produced from corn resulted in an 18%-25% reduction in greenhouse gases (Wang, Michael "Energy and GHG Emission Impacts of Fuel Alcohol" Argonne National Lab, 2005 www.transportation.anl.gov/pdfs/TA/347.pdf). E85 is more flammable than gasoline at low temperatures (32°F), but less flammable at normal temperatures. Pure ethanol is non-toxic, water soluble and biodegradable. Producing ethanol from crop, animal or forestry waste materials can reduce emission and provide a positive energy balance ratio. Additional benefits of ethanol include diversifying our fuel supply and providing alternative markets for farmers. Studies show that E85 yields reductions in greenhouse gas emissions (such as CO_2) from both corn and cellulose (agriculture waste and wood waste) based ethanol.

What is the potential and future prospect for ethanol as a fuel?

Ethanol will not be able to replace the entire gasoline supply due to immense quantity of fuel that is used in the US, but it can be a key part of the solution that is already in use today. Corn-based ethanol is limited by available agricultural land, however the US is not currently utilizing its total agricultural potential and farmers are increasingly selling out to developers because they are not able to financially survive. Further research and development into cellulosic ethanol (using sugars from any plant materials, such as switchgrass) will increase our ethanol capacity and should have a better energy balance.

Where can I get ethanol?

North Carolina has 11 public E85 service stations (most of which sell E10 as well) throughout the state with more being planned or installed that will be operational soon. The most current list of stations can be found on the "North Carolina Biofuel Retail Locations" under factsheets at www.ncmobilecare.org or through an interactive map at www.4cleanfuels.com/mapping.asp. State agencies, local governments, and educational institutions can get E85 at the Motor Fleet Management fueling site on Blue Ridge road in Raleigh, or go to any of the 107 DOT sites around the state to get E10. State and local government fleets may also purchase E10 and E85 in all 100 counties from a state purchasing contract (www.doa.state.nc.us/PandC/fuelcost.htm).

Ethanol Distributors

Osage Inc.	**Ray Thomas Petroleum, Inc**	**United Energy Distributors, Inc**
Earle Spruill, President	www.thomaspetroleum.com	www.unitedenergy.org
earl@cellcom.roacoxmail.com	1629 S. Lafayette St.	Nikki Parrish, Alt. Fuels Manager
5250 Twelve O'clock Knob Rd.	Shelby, NC 28152	altfuels@unitedenergy.org
Roanoke, VA 24018	704-482-0351 / 800-262-5453	PO Box 6987, Aiken , SC 29804
540-375-6501	704-484-8869 (fax)	888-207-2009 / 803-641-1549 x 110
540-375-6506 (fax)	info@thomaspetroleum.com	803-642-0115 (fax)

Resources

National Ethanol Vehicle Coalition	www.e85fuel.com/pdf/ethanol_guidebook.pdf
American Coalition for Ethanol	www.ethanol.org/
Alternative Fuels Data Center	www.afdc.doe.gov/altfuel/ethanol.html
Triangle Clean Cities Coalition	www.trianglecleancities.org
Centralina Clean Fuels Coalition	www.4cleanfuels.com/
Land-of-Sky Clean Vehicles Coalition	www.landofsky.org/planning/p_cvc_home.html
NC Solar Center	www.ncsc.ncsu.edu

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