



## Tech Tip: Alternative Fuels; Gasoline

*"We can get fuel from fruit, from the sumac by the roadside, or from apples, weeds, sawdust; almost anything. There is enough alcohol in one year's yield of an acre of potatoes to cultivate that field for a hundred years. And it remains for someone to find how this fuel can be produced commercially - better fuel at a better price than we now know." — Henry Ford, 1908*

Although not new, alternative fuels have become more common and have gained a lot of attention recently. As concerns about the environment have grown, and gasoline prices continue to climb, alternative fuels have become more available and more widely used. For instance, in the state of Iowa, over 75% of all gasoline sold is an ethanol blend. What is an ethanol blend fuel?

Many gasolines are blended with materials called oxygenates. Oxygenated blended fuels have primarily been used to help keep emissions down, and in turn, keep the air clean. A common material that has been used as an oxygenate is ethanol. While it can be made from a variety of grains and other materials, in North America, corn is the primary source for ethanol. Ethanol used for fuel is an ethyl alcohol made in facilities that produce fuel grade ethanol. The fuel grade ethanol is then blended in a percentage with gasoline to make a finished motor fuel.

Often called gasohol, E-10 (10% ethanol/90% gasoline) contains more oxygen so it burns cleaner and helps reduce greenhouse gases. E-10 is also a very effective cleaning agent and helps to remove deposits throughout the fuel system. Early on, this characteristic often leads to shortened fuel filter life when ethanol enriched fuel is first used. The reason was, when introduced in to a dirty system, the cleansing properties of the ethanol would remove the varnishing and deposits from the fuel tank, lines, carburetor, and other points in the system. Of course the fuel filter would trap and hold this contamination and the dirt from previous gasoline fills would fill the filter to its dirt holding capacity. Once the system was cleaned, fuel filter plugging would no longer be experienced. Likewise, on the dispensing side of things, if pumps, transportation, and storage systems were not kept clean, ethanol can "clean" these systems and introduce the contaminants in to the vehicle's fuel system.

Nowadays, if the distribution network is properly maintained and the gasoline is clean going in to the vehicle, a plugged vehicle fuel filter due to the use of E-10 is a very rare occurrence. Also, today's gasoline contains detergents that keep the fuel system clean and prevent deposits from forming. Therefore, the automotive systems stay clean and, again, fuel filter plugging due to the use of E-10 is rare. More often than not, if excessive fuel filter plugging is experienced immediately after the introduction of an ethanol blend, the cause was improper cleaning and preparation on the dispensing side of things.

Since the 1980's, all vehicles worldwide have been manufactured with fuel systems that are designed to use a blend of up to 10% ethanol, E-10. Even manufacturers of small engines have designed and manufactured their engines to be E-10 capable. Myths still circulate about ethanol compatibility even though they have long since been disproved. For example, one myth that is still circulated is that E-10 is trouble for fuel injectors. In reality, since ethanol burns 100% and leaves no residue, it is not possible for it to cause or contribute to deposit formation. Further, E-10 actually helps keep fuel injectors clean and thereby preventing performance issues due to dirty injectors.

Beginning in the mid 1990's, vehicle manufacturers introduced automobiles and light trucks that were capable of using a fuel that is 85% ethanol and 15% gasoline (E-85). These vehicles have systems that have the correct sensors and components that can properly use the E-85 fuel. While all gasoline automobiles and light trucks can use E-10, not all can use E-85. Only those vehicles identified as a Flex Fuel Vehicle (FFV) are capable of using the E-85 gasoline. A FFV can use any gasoline from 100% unleaded to 85% ethanol.

As with the lower percentage blends, E-85 is a very effective cleaning agent and if placed in a dirty system, or dispensed through a dirty distribution system, shortened filter life may be experienced until the system is clean. For dispensing equipment, we carry several pump filters that are appropriate for use with E-85 fuel. These numbers are shown in the table below.

E-85 Dispensing Pump Part #s
24003 with #s 24004 & 24044
24006, 24347, 24050, 24051, 24029
24104, 24005

All fuel filters listed in the current print and electronic Passenger Car and Light Truck Application guides for FFVs are also designed for use with any gasoline from 100% unleaded to E-85.