

## **What is the difference between renewable diesel and traditional biodiesel - if any?**

Lower emissions, cleaner, and more efficiently burning than traditional biodiesel, with better cold and storage properties. Many motorists are not aware of the differences between renewable diesel and traditional biodiesel, even though they should be.

High-quality renewable diesel (also known as Hydrotreated Vegetable Oil or HVO) and traditional biodiesel (also known as Fatty Acid Methyl Ester or FAME) are often confused. They are, however, different products, even though both are made from organic biomasses. The differences can be found, for example, in their production process, cleanliness, and quality.

Premium-quality, HVO-type is made primarily from **waste and residues**. In the production process, impurities are removed from the raw materials which are then hydrotreated at a high temperature. The outcome is a colorless and odorless fuel of an even quality that has an identical chemical composition with fossil diesel. It is also often called an "advanced biofuel" or "second-generation biofuel".

Traditional, first-generation FAME-type biodiesel, on the other hand, is produced by esterifying vegetable oils or fats, e.g. a specific mixture of soybean oil, methanol and sodium methylate. The esterification process restricts the use of poor quality or impure raw materials, such as waste and residues. The quality of traditional biodiesel varies also in other respects according to the raw materials used.

### **Only renewable diesel can be comingled with petroleum-based diesel**

Even though both bio-based fuels help in replacing fossil fuels with renewables and thereby reduce global climate emissions, only renewable diesel can be used in high concentrations and even as a standalone product in all diesel engines. The U.S. has already been using high concentrations as the renewable diesel fuel to meet the EPA renewable fuel standards (RFS).

From the perspective of chemical composition, conventional fossil diesel and renewable diesel are both hydrocarbons. Traditional biodiesel is an ester, which may cause problems in some motor engines. Any high concentrations can cause problems, such as damage to the rubber and plastics parts in the fuels system or carbon build-up in the engine. Traditional biodiesel can also absorb water, which may result in microbial growth in the fuel tank during storage causing additional use issues.

It may also contain impurities due to the raw materials used or the production process. Modern automotive technology and advanced engines have considerably higher requirements for the quality of the fuel, after all.

### **No special requirements for the vehicle, stands cold and storage**

The user of renewable diesel does not need to fear microbial growth caused by impurities, which could clog the fuel filters of the car. Its use does not increase the frequency of the periodic maintenance of the car or need for oil changes, either, which is something that might happen with some traditional biodiesels. Its use does not require any modifications to the fuel systems of the vehicle, regardless of the age or make of the car. In other words, renewable diesel can be taken into use right away.

Renewable diesel is made for cold, even arctic conditions. Its properties are identical to the highest-quality fossil diesels. The motorist does not have to fear that the car breaking down on the road even in the coldest winter temperatures.

The high cetane number, 75-95, means that the fuel burns cleanly and the car engine gets more power. It also makes starting the car engine easier in cold temperatures and decreases fuel consumption, especially when driving in an urban environment.

The cetane number of traditional biofuels is usually 50-60, and their cold resistance and shelf life of are considerably weaker. With them, problems related to cold temperatures have been observed even at mild temperatures of +5 °C (41 °F).

### **Cleaner air both locally and globally**

The greenhouse gas emissions of renewable diesel and traditional biodiesel are both smaller than those from fossil diesel, but renewable diesel is better option also in this respect.

When renewable diesel is used in 100% concentration, the carbon emissions from traffic are most effectively reduced and reaching of global climate targets best supported. The use of renewable diesel also reduces particle, hydrocarbon and nitrogen oxide emissions. These tailpipe emissions affect the quality of local air in particular. Renewable diesel is, thus, an excellent choice also in urban conditions, such as for buses, waste transport, emergency response vehicles, and corresponding applications.

All in all, the renewable diesel and traditional biodiesel differ quite a lot; in fact, they are two completely different products. Because renewable diesel is a cleaner, higher quality product that stands cold and storage much better than traditional biodiesel, the benefits that renewable diesel offers to the vehicle, the motorist, and ultimately the climate are the greatest when 100% renewable diesel is used.