

w h i t e p a p e r



# HVO fuels, too good to be true?

**Continuing to do business, while at the same time reducing the environmental impact. It is high on the agenda of many business owners and politicians. One of the options is to use non-fossil fuels. We will discuss this in more detail in this white paper. What exactly are these fuels, what do I achieve with them and what should I pay attention to?**



## What is HVO (and above all, what not)?

Non-fossil fuels are, as the name implies, not made from fossil resources such as oil or natural gas. They are produced from vegetable and animal materials such as plant residues, vegetable fats and animal fats.

Many names are in use for these non-fossil fuels. Blue diesel, CO<sub>2</sub> fuel, Green diesel, synthetic diesel; are all brand names used and often referred to as BIO DIESEL for simplicity. To dispel a myth: HVO is not BIO diesel.

Although BIO diesel and HVO basically use the same raw materials, the manufacturing process is fundamentally different.

## What is BIO diesel?

BIO diesel is generally offered as an admixture (“blend”) with regular fossil diesel. FAME (Fatty Acid Methyl Esters) is used for this. FAME is made from animal and vegetable oils and fats that are converted into fatty acids. FAME is based on esters. FAME easily attracts water and dirt particles due to the polarity of the esters. This can clog fuel filters. In addition, FAME has a higher solidification point than normal diesel. At lower temperatures, the FAME will clump and get stuck in the fuel filters of the engine.

## What is HVO?

HVO stands for Hydrotreated Vegetable Oil. The production process uses hydrogen to extract oxygen from the biomass. After extracting oxygen from the biomass, a mixture of linear paraffin hydrocarbon molecules, water and CO<sub>2</sub> is formed.

HVO is therefore a mixture of different paraffin hydrocarbons that is free from sulfur and aromatics. This makes it possible to greatly reduce particulate matter, nitrogen and sulfur emissions with HVO.

In addition, HVO has a high cetane number of up to 76 (for regular diesel that is 51). A higher cetane number means a more efficient and cleaner combustion. The cetane number of a diesel indicates how quickly the fuel ignites. The higher the cetane number, the faster the fuel will ignite and the more efficiently the engine will run. On the other hand, HVO has a lower energy content than regular diesel. Signaling fuel savings is therefore not to be expected with HVO.

## What does the use of HVO bring for me?

- The main advantage of using HVO is the reduction of CO<sub>2</sub>. HVO fuels are certified by the ISCC\* and offer a CO<sub>2</sub> reduction of up to 89%. This saving is a (calculated) maximum that is realized in the total chain, or “from well to wheel”. So from the source (extraction) to the exhaust.
- The cleaner combustion also significantly reduces NO<sub>x</sub>, particulate matter and sulfur emissions
- The cleaner combustion also means less pollution in the particulate filters

## Can I use HVO in any machine?

In principle, an HVO fuel can be used in any modern diesel engine, both in 100% pure form and in mixed form (mixed with regular diesel). A good quality HVO fuel must comply with the EN15940 standard for synthetic fuels. Always ask your supplier of the diesel engine, or the machine in which it is used, for the specific approval to use HVO fuels.

The use of HVO in older engines (we call these pre-stage V engines for convenience) can lead to problems with elastomer piping such as fuel hoses, gaskets and rings.

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\* *note: ISCC stands for International Sustainability and Carbon Certification and is a sustainability certification system. It includes all sustainable raw materials, including agricultural and forestry biomass, circular and biobased materials and renewable energy sources.*

## Are there any disadvantages to the use of HVO?

Significantly reducing CO<sub>2</sub>, NO<sub>x</sub>, particulate matter and sulfur by only using a different fuel sounds almost too good to be true and there are also disadvantages to the use of HVO. The main points of attention are:

- HVO is more expensive than regular diesel. The price difference fluctuates, as a rule the price difference is approx. 30-40 eurocents per liter
- The availability of HVO is somewhat more difficult than that of regular diesel, especially at project locations.
- In order to achieve the maximum environmental benefit, mixing with regular diesel must be avoided. This requires a complete switch to HVO only, or to separate fuel installations.

## Conclusion

The use of HVO fuels in combination with modern stage V diesel engines offers the possibility to make a relatively simple contribution to the environmental goals. The disadvantages mentioned are minor compared to the environmental gains that can be achieved with the use of HVO fuels. When purchasing new construction equipment, always verify with the manufacturer about the suitability of these machines in combination with HVO, and discuss the delivery of HVO fuels with your fuel supplier.



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