Frequently asked questions on HVO fuel

What is HVO?

1

What is HVO fuel? What is it made of?

HVO is a hydrotreated vegetable oil that is produced without fossil resources by processing renewable materials such as plant matter, waste fats and vegetable oils. These 'lipids' are made of paraffinic hydrocarbons and result in a low-carbon fuel.

2

What is the difference between HVO and diesel?

HVO fuel has similar chemical and physical properties to diesel fuel. However, its fossil-free composition and low carbon content make it an appealing sustainable fuel option, differentiating it from diesel. HVO also has approximately 7% less fuel density, limited aromatic and sulfur content, and a higher cetane value versus diesel fuel. Despite these differences, HVO can be blended with diesel in any proportion.

3

Is HVO different to Biodiesel?

While HVO is derived from the same materials used to produce biodiesel, it is produced via a different, hydrotreated, process that helps improve its oxidation stability. This means that HVO is not prone to bacterial growth in comparison with biodiesel, making HVO a great, sustainable option for Dynamic Rotary UPS applications.

4

What is the difference between HVO and Gas to Liquid (GTL) fuels?

Physically and chemically, these fuels are the same fuel and meet the EN 15940 fuel specification. However, HVO has a lower life cycle carbon emission compared to GTL fuels. This is because HVO is produced from renewable feedstocks, while GTL fuels are produced from natural gas, which is a fossil fuel.

5

Why is HVO being promoted more than other renewable fuels?

There are four main reasons for this:

1. HVO's very low carbon content and reduced emissions
2. Its comparable specification to diesel/biodiesel
3. Its ability to be mixed to any concentration level with existing diesel/biodiesel
4. It's long storage life and resistance to bacterial growth

All of this helps operators meet their carbon reduction goals without compromising operational reliability and performance.

6 **What changes are needed to upfit existing HITEC units to run on HVO fuel?**

No changes or modifications to hardware or software should be needed to run approved HITEC units on HVO fuels. However, we recommend that you consult HITEC beforehand as we offer a full testing and verification service to ensure that everything works as it should with HVO.

7 **How readily available and widely adopted is HVO?**

As a relatively new fuel source, the rate of adoption of HVO today is limited by its supply chain and higher cost, with higher adoption in markets where the use of diesel is restricted. Supply chains are developing to serve these regulated markets, predominantly in parts of North America and Europe. Increasing demand driven by a combination of regulatory and customer ESG targets will drive increased production, which will subsequently lead to increased adoption. The IEA Renewables 2020 report predicts that the average output in 2023-2025 will be 63 billion L, a 30% increase from the 2019 level. The majority of this increase is attributed to expanding HVO production in Singapore and the United States.

HITEC Power Protection approval and warranty

8 **Does HITEC approve the use of HVO fuel on HITEC Dynamic UPS systems?**

All new HITEC UPS systems equipped with certified Cummins engines are approved for operating with HVO. For existing systems we recommend that you consult HITEC before swapping to HVO as we offer a full testing and verification service to ensure that everything works as it should with the new fuel.

9 **Does HITEC recommend an HVO fuel specification?**

The HVO fuel must fully comply with the requirements of EN 15940.

HVO fuel with a higher flash point than the minimal requirement by EN 15940 can be used. Please get confirmation from the HVO fuel supplier that it meets any applicable local regulations.

10 **Can we purchase HVO fuel from any manufacturer?**

HVO may be sourced from any supplier provided that the fuel complies with EN 15940.

11 **Are HITEC products covered under warranty using HVO fuel?**

Yes, warranty is covered for all approved products using compliant EN 15940 HVO fuel.

12 **What procedure should be followed to use HVO fuel on a product not pre-approved by HITEC?**

For existing systems we recommend that you consult HITEC before swapping to HVO as we offer a full testing and verification service to ensure that everything works as it should with the new fuel.

Performance

13 **Is there a power performance difference between HVO fuel and Diesel?**

There is a potential engine power reduction (kW mechanical) of 1 – 2% due to the lower energy density of HVO fuel. However, as most HITEC DRUPS systems have sufficient margin between their engine power rating and their UPS power rating, there will be no reduction in useable output power (kW electrical).

14 **Is there a difference between diesel and HVO fuel fuel consumption?**

Due to its lower density, HVO fuel has up to a 5% higher fuel consumption than diesel.

15 **Can HVO fuel be mixed with Diesel Fuel in the fuel tank?**

Any blend of diesel and HVO is acceptable.

16 **Is there any additional maintenance when using HVO fuel?**

No, the maintenance regime and procedures are unchanged.

Emissions compliance

17 **Is there any impact to emissions performance when using HVO?**

Yes. While NOx emissions are comparable with diesel, Particulate Matter (and soot) emissions are lower when using HVO fuel.

18 **Is there any impact to Emissions Certifications?**

No. EPA Tier 2 certification and TA Luft 2g compliance are not impacted by the use of HVO fuel.

19 **Are there separate emissions data sheets for HVO?**

Yes. HVO emission data can be recorded during factory testing or at the customer site.

Operation and maintenance

20 **What are the recommendations for storage and fuel polishing of HVO?**

Fuel polishing and storage recommendations are the same for diesel and HVO. Most fuel polishing systems will work with either diesel or HVO without modification.

As the concentration of HVO increases fuel test data will determine when the fuel is clean, dry & sediment free. Fuel polishing frequency can then be reduced..

21 **Is bacterial growth a concern with HVO as it is with biodiesel?**

No. HVO is a more stable fuel than biodiesel and is not susceptible to bacterial growth and oxidation stability concerns.

22 **What are the considerations regarding cold weather operability with HVO?**

Confirm with the fuel supplier that the HVO purchased will work at all site ambient conditions.

23 **Can fuel heaters/coolers be used with HVO?**

Yes.