



Application Study: Biodiesel Field Test Kit

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Bionic Fuels are small / medium size commercial biodiesel producer based in East Sussex, UK. The company has been involved in testing and assisting in the development of a biodiesel specific field test kit designed to give key data throughout the production cycle.

Biodiesel production, despite being a fairly simple chemical reaction, encompasses many variables that can affect finished product quality. There is a recognised European standard (EN14214), however, the full suite of tests can be costly and the regularity with which these tests may be required can prove cost negative for the smaller producer. That said, sub standard fuel producers have in the past caused the fledgling industry to attract a bad name in some areas.



Most commercial producers now realise that in order to compete in the important fleet sector, quality is not only a key buying motivator but a prerequisite to opening discussions. The problem then, is to identify and

manage the variables in batches between regular laboratory tests.



Kittiwake have developed the biodiesel field test kit which accurately identifies the key factors required to meet the EN14214 standard. The kit offers real time instant feedback on feedstock and biodiesel both during and post processing. To the small / medium size producer this information and the frequency with which it can be drawn allows them to identify variations against the laboratory tested batch. Once variations are identified the user can act quickly to compensate or

avoid cross contamination, potentially saving thousands of pounds and man hours.

"The Kittiwake biodiesel test kit has provided us constant, tangible, batch by batch data that can be recorded as part of our ongoing quality control. The key point indicators of water content, total acid number, density and viscosity give us early indication of off spec batches or production trends. The compact design of the kit allows us to make on the spot decisions when buying feedstock throughout Europe, often giving us the edge over those who require samples to be sent for laboratory testing. The use of this kit has not only given us greater confidence in our product continuity, it has become an integral part of our production process and even influenced the development of our production facilities." Frank Harris

Benefits

Manufacturers can:

- Optimise the ratio of chemicals used
- Gain real-time batch by batch data
- Ensure quality of base stocks
- Refine and troubleshoot production
- Ensure end product quality and consistency

End users can:

- Ensure quality of delivered fuel
- Monitor batch to batch consistency
- Check stored bio-diesel for deterioration over time
- Gain confidence in producer

Biodiesel Application Flash

HORIBA Jobin Yvon (France) provides a complete analytical support to help first-time users as well as experienced analysts. It consists of a series of application notes or application flash which describes the operating conditions, the benefit of a specific accessory or analytical optimisation to improve sensitivity, stability, accuracy.

This application flash describes the analytical procedure for all products from raw materials to biodiesel, following the international norms (ASTM D-6751, pr EN 14214, E DIN 51606). Depending on the product, the sample preparation may vary, in terms of solvent choice.

However, the sample introduction system and parameters are the same, and analyses can be performed in a routine way. The ACTIVA-S is the ideal ICP-AES instrument for this application, thanks to its Simplicity and Stability criteria. The limits of detection are estimated from a calibration in 10 % Base Oil in Kerosene, with the formula $LOD = 3 \times SD$. SD is the Standard Deviation of the blank concentration from an analysis with 10 replicates. The limit of quantification is then $LOQ = 3.3 \times LOD$.

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