



Rapid Analysis by NIR Ensures Consistent Quality of Fuel and Oil Products Across a Countrywide Distribution Network

In recent years, biofuels have increased in popularity due to their environmental benefits. It is now common place to blend biofuels with fossil fuels for use in diesel engines. This has led to the development of new regulations to quantify the composition of fuel blends.

An extensive infrastructure of pipelines and storage facilities is required to ensure a ready supply of fuel exactly where customers need it, from gas stations to airports. One challenge today is how to remotely monitor fuel quality and confirm the varying fuel blend composition required, without delaying delivery to customers. To ensure consistency of supply it is important that quality control checks are implemented across all storage facilities, regardless of their location. With over 30 Spectrum™ FT-IR systems installed across a fuel distribution network, product quality is confirmed in seconds, simply by the touch of a button.



CLH & the logistics of oil transportation in Spain

CLH (Compañía Logística de Hidrocarburos) is the leading company in Spain for the transportation and storage of oil products, including aviation fuels and lubricants. With over 60 years of experience, they are recognized for their excellence in operations and logistics. Across the country they have a network of pipelines extending more than 3,800 km. Their 37 storage facilities have a total capacity of over 6.7 cubic meters. This is supported by a 1,700 strong team of employees.

CLH Aviación, part of the CLH group, operates at the majority of Spanish airports providing storage and supply of aviation fuel and lubricants for all the major fuel companies.

Coordinated from a central laboratory in Madrid, CLH has a network of seven laboratories for the analysis of petrol, diesel, oil, biodiesel and additives following standard EN and ASTM norms. In addition, in-situ testing at all its storage facilities is completed to confirm the oil blend and ensure quality of the final product.



Driving productivity improvements with NIR analysis

CLH (Compañía Logística de Hidrocarburos), the leading company in Spain for the transportation and storage of oil products, were looking to reduce their analysis time by implementing in-situ oil analysis at their storage facilities. This would improve productivity by reducing reliance on their testing laboratories for all sample analysis. Near IR (NIR) analysis from PerkinElmer, using the Spectrum 100N* system, proved to be the solution. The ability to confirm product quality, regardless of location, is now at CLH's fingertips. The easy and fast sampling technique generates results immediately, (figure 1). The additional capability to transfer calibration models between networked instruments further improved laboratory productivity.

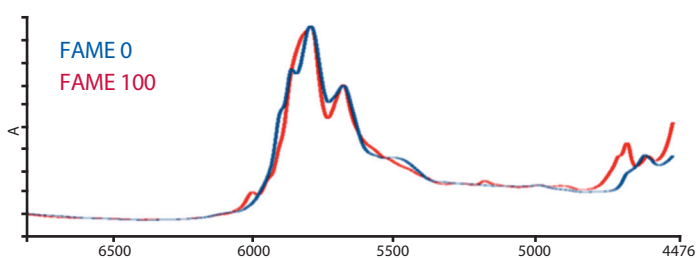


Figure 1: A typical biodiesel blend analysis.

* The Spectrum 100N is superseded by the PerkinElmer Frontier FT-IR system. This provides at least equivalent capabilities to the Spectrum 100N.

Centralised calibration saves time

Calibration models can be readily transferred between instruments with the unique "Absolute Virtual Instrument" (AVI) capability of the Spectrum IR systems. Setting up a calibration model for a given method can take several weeks and involves running multiple standard solutions. This is no longer necessary to complete on every instrument. With PerkinElmer's AVI capability, analysts can develop one calibration model centrally which can then be transferred to any other instrument on the same network. This represented a significant time saving for CLH; in total over three months of instrument time was saved by using the AVI tool.

“At CLH we understand the significance of maintaining product quality and its importance to our customers. Installation of PerkinElmer’s FT-NIR instruments in all our storage facilities improved the operations in receiving, mixing and expediting fuel blends produced in-situ. NIR methods allow different fuels properties to be analyzed easily and quickly, without lengthy sample preparation. We are assured of accurate and reproducible results to confirm product quality.”

Antonio Diaz, Laboratory Manager CLH Central Testing Laboratory, Madrid.

An inter laboratory comparison confirmed that every instrument was producing consistent results. CLH now have complete confidence that the consistent and reproducible results are produced across all samples and all testing laboratories. This capability was instrumental in CLH choosing PerkinElmer as their FT-IR provider.

Maximize efficiency with AssureID

The ultimate software tool for quality control, AssureID enables non expert users to generate consistent results. In the case of CLH, their central laboratory develops customized methods for each type of analysis. They configure each step in the workflow providing a framework for analysis. Operators in the storage facilities are then provided with the means to run samples in seconds, following prompts in local language. The laboratory based supervisor can then review the results database and sign and approve reports remotely.

Real time analysis improves productivity

This analysis at the point of delivery is critical, CLH need to confirm the composition of the biodiesel blend, as the required composition can vary from customer to customer. Before CLH installed NIR systems at their storage facilities there was a delay of over half a day in receiving the results as the samples were sent to one of their seven testing laboratories. Results are now available in minutes not hours, as analysis is completed in-situ on the Spectrum 100N system. In addition the easy to use sampling system on the Spectrum system, with users following methods that are developed centrally, yields further improvements in productivity for CLH.

The team at CLH also evaluated NIR for the analysis of oxygenates compounds (such as ethanol and ETBE (Ethyl Tertiary Butyl Ether) present in gasoline. They previously used the more traditional approach of gas chromatography, with a run time over 30 minutes. Switching to NIR, CLH benefits from a dramatic increase in sample throughput. A single run on the Spectrum 100N system is now complete in less than one minute, (figure 2). They developed a database containing all the permutations of compound mixtures and gasoline types, NIR analysis was implemented.

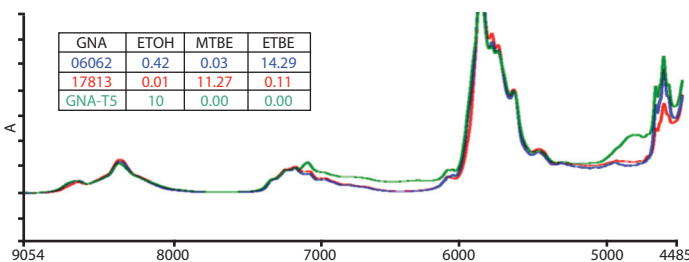
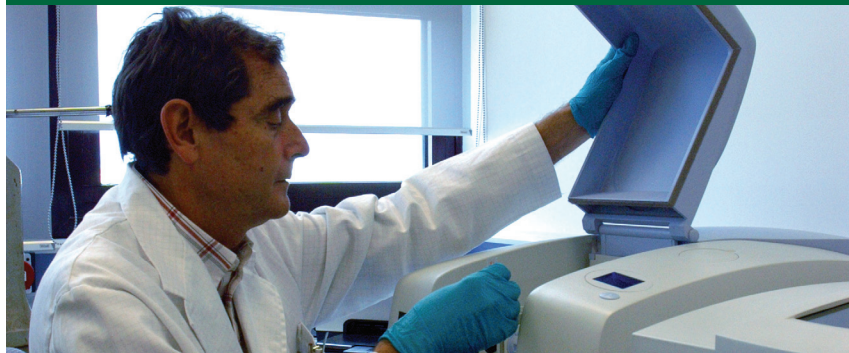


Figure 2: Ethanol, MTBE and ETBE analysis in gasoline.

The preferred NIR partner for your laboratory, PerkinElmer

CLH relies on the NIR instruments from PerkinElmer to confirm the quality and ensure consistency of the oil products that they distribute.

With over 65 years of industry experience, PerkinElmer have the experience and depth of understanding to address any application problem. The team of scientists readily collaborate with customers in method development and application support to ensure the instruments maximum potential is realised.



Antonio Diaz is analyzing a biodiesel blend in the Central lab located in Madrid.

Key benefits of the FT-IR System:

- Centralised method development using “Absolute Virtual Instrument” (AVI) eliminates the need to duplicate method and calibration model development. The cost of implementation is reduced and consistent results assured between sites, maximizing sample throughput.
- Remote review and approval of results through the AssureID. Maximize laboratory productivity and work flow as supervisors can review the results database and sign the results or retrieve statistical information.
- Reproducible measurements, day after day, month after month due to innovative interferometer technology designed for robust, reliable operation and longevity.
- Fast and simple operator training ensures operator error is virtually eliminated. The use of AssureID provides a very simple wizard-style interface. Users have the capability to customize on screen instructions which are available in local languages.

Company: CLH (Compañía Logística de Hidrocarburos)

Size: 1,678 employees; 7 laboratories across Spain completing product analysis.

Business: Storage and transportation of oil products.

CLH (Compañía Logística de Hidrocarburos) is the leading company in Spain for the transportation and storage of oil products, including aviation fuels and lubricants. With over 80 years of experience, they are recognized for their excellence in operations and logistics. Across the country they have a network of pipelines extending more than 4,000 km. Their 37 storage facilities have a total capacity of over 7.2 million cubic meters.

2007: Installed eight Spectrum 100 NIR systems for the analysis of oil and related products.

2008: Added a further ten Spectrum 100 NIR systems for in-situ analysis.

2009: An additional fifteen Spectrum 100 NIR systems were installed. Now there are a total of thirty three systems in use in storage plants and testing laboratories across the CLH network.