APPLICATION NOTE

BAYSPEC
Pervasive Spectroscopy

# Portable Multi-platform Raman System for Fuel Analysis

## Fuel analysis on-the-go is realized by BaySpec's newly developed multi-wavelength, multi-platform *Agility*™



The nondestructive Raman analysis produces chemically specific spectra and enables accurate identification and quantification. However, in the past, this technology was very difficult to be applied for fuel analysis, because most fuels, either derived from petroleum or plant-based materials, are highly fluorescent. Fluorescence interference (thousands of times stronger than Raman scattering) is the biggest obstacle which completely masks or significantly reduces the quality of the Raman spectra.

BaySpec's new transportable ***Agility***™ product line features dispersive multi-wavelength (including 1064 nm) Raman spectroscopy technology. Now liquid fuels' measurements and analysis are simple tasks done in a few seconds, without contacting, or any preparation of the sample. Unlike other optical measurements, the fluorescence background and the color of the sample does not affect the quality of the 1064 nm Raman measurement.

The transportable instrument is miniaturized into a size of 310 mm × 380 mm × 170 mm and less than 7 Kg. It is integrated with its own computer and easy-to-use software. The analysis is done automatically that an unskilled incidental operator can analyze a sample in almost real time.

The dispersive 1064 nm Raman spectroscopy technology is capable of identifying fuel types, quantifying fuel compositions, detecting contaminations, and calculating fuel parameters such as melting point, cloud point and cetane/octane number. Compared to traditional 1064 nm FT-Raman technology, our instrument is much more compact and much faster in measurements. There are no moving parts in the unit, which is rugged in a hardened case and is very reliable in harsh environments and extended temperature ranges. The laser is fully enclosed to guarantee maximum eye safety. With Agility's multi-platform design, samples can be measured either in their original container by Agility's extended Raman probe, or in sample vial holders. The minimal sampling volume is 0.01 mL.

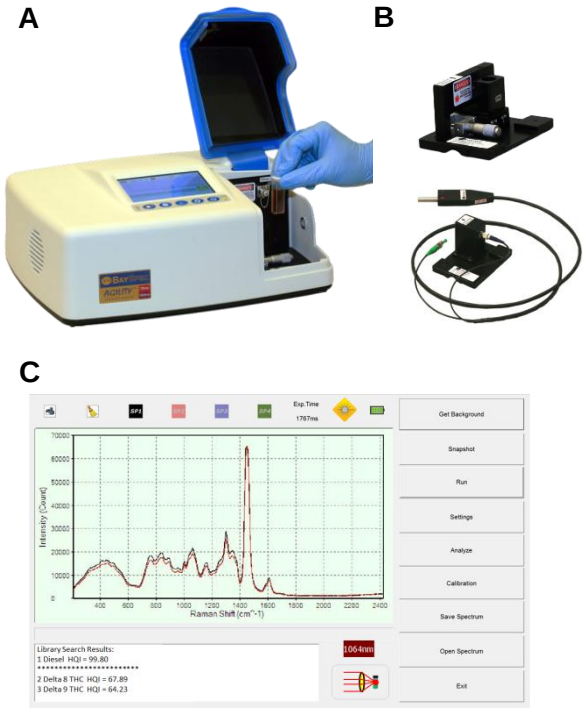


**Figure 1**. (**A**) BaySpec's ***Agility***™ Raman analyzer. (**B**) Vial holder and fiber probe options for ***Agility***™. (**C**) BaySpec's Agile 20/20 with graphical user interface is a powerful software package that acquires and analyzes spectra, calibrates wavelength, verifies and identifies substances, and manages user-built or third-party spectral libraries (the spectra shown are from diesel).

The ***Agility***™ is now available for the market. For more information on this line of products and our complete lines of spectroscopic instruments contact BaySpec.

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