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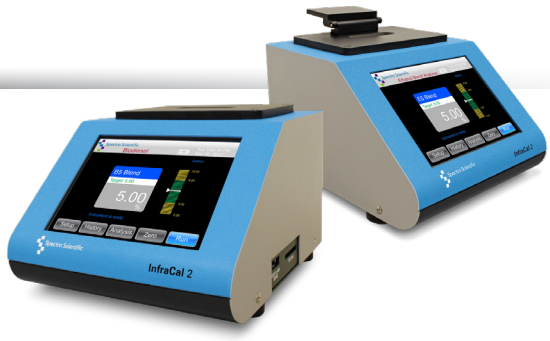
Infracal 2 Biofuel Analyzers

MEASURING PERCENT BIODIESEL IN DIESEL OR ETHANOL IN GASOLINE



As more mandates for a minimum of ethanol in gasoline and biodiesel in diesel come into effect, a large number of major oil companies are blending higher percentages of biofuels at their terminals. Although manufacturers of in-line blending systems claim indisputable accuracy, a quick analytical measurement method to assess the blend ratio gives real data to a claimed assumption

In less than a minute, the user gets a direct readout in percent biodiesel or ethanol on-site at a terminal, distribution center or laboratory.

This can be a valuable asset for:

- Terminal managers
- Fuel distributors
- Engine manufacturers
- Fleet operators
- Regulatory agencies

InfraCal 2 Biofuel Analyzers are:

- Rugged and compact
- Portable and easy to use
- Designed for non-technical personnel



The InfraCal 2 Biofuel Analyzer is a low-cost, single wavelength analyzer with filters preset for a particular measurement – either biodiesel in diesel or ethanol in gasoline. Biodiesel has a characteristic infrared absorption band at 5.73 µm (1745 cm^{-1}). Ethanol's infrared absorbance is at 9.6 µm (1045 cm^{-1}). As the biodiesel or ethanol percentage increases, the infrared absorbance increases. An internal calibration table in the InfraCal 2 Biofuel Analyzer converts infrared absorbance to a digital readout in percent. A fuel sample is placed directly on the exposed ATR sample window and in seconds the percent biodiesel or percent ethanol is displayed. The fuel is easily cleaned off the window using a solvent and a wipe and the analyzer is ready for the next sample. The InfraCal 2 Biofuel Analyzers are ideal where a single, repetitive analysis is needed.

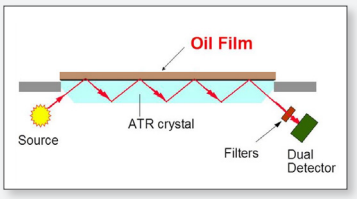
InfraCal 2 ATR-B for measuring percent biodiesel has a measurement range of 0-100% biodiesel in diesel and an accuracy of +/- 0.2, the InfraCal 2 is based on proven IR technology developed by Wilks and used by regulatory agencies and fuel terminals worldwide. The compact, easy-to-use InfraCal 2 ATR-B measurement results are comparable to both ASTM D7371 and EN 14078.

Biodiesel in diesel 0.2-30% +/- 0.2 +/- 0.2
Biodiesel in diesel 30-100% +/- 1% of concentration

The InfraCal 2 ATR-E is the latest introduction to our easy to use analyzers for measuring ethanol in petrol. The InfraCal 2 ATR-E is a stand-alone fixed filter infrared instrument that gives results that are comparable to gas chromatographic methods and correlates with ASTM 4815.

Ethanol in gasoline 0-20% +/- 0.2
Ethanol in gasoline 70-98% +/- 1% of concentration

Principle of Operation



Samples are applied to a zinc selenide (ZnSe) attenuated total reflectance (ATR) sample plate. Infrared light from a source bounces multiple times between the top and bottom surfaces of ZnSe crystal as it travels horizontally from one side to the other. It is then filtered and measured by the detector. The loss of the light at a specific wavelength is due to the absorption by the fuel sample on the top plate and it is then calculated to percentage of biodiesel or ethanol based on calibration

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InfraCal 2 Biofuel Analyzers Product Information

PART NUMBERS	
405-2041-24	Model ATR-B calibrated: 0-100% biodiesel in diesel using standards prepared by a certified laboratory. Includes internal battery and universal power supply.
405-2042-30	Model ATR-E calibrated: 0-20% & 70-100% ethanol in gasoline using standards prepared by a certified laboratory. Includes internal battery and universal power supply.

SPECIFICATIONS		
	InfraCal 2 ATR-B	**InfraCal 2 ATR-E**
Applications	Biodiesel in diesel	Ethanol in gasoline
Analytical Wavelength/ Wave Number	5.7 mm, 1745 cm^{-1}	9.6 mm, 1045 cm^{-1}
Outputs	% (by weight) biodiesel in diesel	% (by weight) ethanol in gasoline
Analytical Range	0-100%	0-20 & 70-98%
Analysis Time	Less than 30 seconds	Less than 30 seconds
Instrument Repeatability	0-30% ± 0.2%, 20-100% ±1% of biodiesel (FAME) concentration	0-20% ± 0.2%, 20-98% ± 1% of ethanol in petrol concentration

USER INTERFACE SPECIFICATIONS	
User Interface	6" color display
Data input	Touch screen
Communication Port	USB, RS 232

POWER REQUIREMENTS	
Battery Power Source	18 volt NiCad battery
External Power Requirements	18 volts DC, 3.3 amps
Power Adaptor Input	Universal AC provided, optional auto adapter
Battery Run Time	4-6 hours

OPERATING SPECIFICATIONS	
Sample Volume	< 1 ml
Solvent/Reagent	None
Operating Temperature	5°C - 40°C
Relative Humidity	0-90%, non-condensing
Altitude	Up to 5000 meters

MECHANICAL SPECIFICATIONS	
Weight	7.0 lbs (3.2 kg)
Dimensions	6.7" x 7.8" x 5.2" (170 x 198 x 132 mm)
Shipping Weight	8.0 lbs (3.6 kg)
Shipping Dimensions	10 x 10 x 14" (254 x 254 x 355 mm)

COMPLIANCE
CE, FCC Class B, NEMA 2, IP31

INFRACAL 2 ATR-B CALIBRATION STANDARD SETS	
403-1050	**0-30% Biodiesel in Diesel Calibration Standards** The set includes eight standards; 0, 2, 5, 10, 15, 20, 25, and 30% biodiesel in High Cetane diesel fuel prepared by a certified laboratory. Each vial contains 20 ml of standard, good for a minimum of 15 tests.
403-1024	**0-100% Biodiesel in Diesel Calibration Standards** The set includes twelve standards; 0, 2, 5, 10, 15, 20, 25, 30, 50, 75, 95, 100 biodiesel in High Cetane diesel fuel prepared by a certified laboratory. Each vial contains 20 ml of standard, good for a minimum of 15 tests.

INFRACAL 2 ATR-E CALIBRATION STANDARD SETS	
403-1026	**5 Point Ethanol Low Concentration Calibration Standard Set** Standard concentrations are 0, 5, 10, 15, and 20% ethanol in gasoline. Standards are prepared by a certified laboratory. Each vial contains 20 ml of standard, good for a minimum of 15 tests.
403-1027	**5 Point Ethanol High Concentration Calibration Standard Set** Standard concentrations are 70, 80, 90, 95, and 100% ethanol in gasoline. Standards are prepared by a certified laboratory. Each vial contains 20 ml of standard, good for a minimum of 15 tests.

ACCESSORIES	
403-0013	Carrying case for InfraCal Analyzers with pre-diced foam. 18.5" x 14.6" x 8"; 10 lbs
403-1086	Dust cover



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