



# Renewable Fuel Solutions

PAC is committed to being part of the solution to help our customers meet their renewable goals. Our portfolio includes the world's most respected and long-established brands of analytical and testing equipment. Each of our brands has a long track record of developing best-in-class analytical instrumentation for lab and process applications. In close cooperation with various standards organizations throughout the world, PAC introduces innovative instruments and applications which adhere to various standards by ASTM, CEN, DIN, GPA, IP, ISO, and UOP.

PAC helps customers in the renewable fuel industry:

- ✓ Increase operational capacity
- ✓ Maximize production
- ✓ Reduce variability
- ✓ Maximize percentage yield
- ✓ Reduce downtime
- ✓ Contain operational expenses

# A Track Record of Success Across the Globe

PAC maintains a strong global presence, with 13 offices around the world, plus a network of 140 distributors, to provide excellent service and support to our customers.

**We have an installed base of hundreds of thousands of instruments located across six continents.**



# Meeting Challenges Head On

Countries all over the world are establishing stricter environmental guidelines, which is driving fuel producers to find greener fuel alternatives to traditional petroleum-based fuels. These include sustainable aviation fuel, ethanol, renewable diesel, biodiesel, and even hydrogen. Despite the trend toward green solutions, alternative fuels continue to face significant barriers for market growth. These include:



## Managing Feedstock

When it comes to renewable fuel sources, the feedstock is widely varied. However, the limited amount of available feedstock, as well as the controversy around feedstock being used for fuel rather than to abate global food scarcity contributes to low production as a result of feedstock availability.

**PAC helps biofuel producers optimize operating parameters to maximize percentage yield.**



## Operating Amidst Uncertainty

As the price of crude oil increases, biofuels become more economically feasible. However, the price of oil is heavily impacted by economic and geopolitical events, making it volatile and hard to forecast. This makes it hard to predict long-term demand for biofuels.

**PAC helps biofuel producers reduce product variability and ensure uptime and maximize profitability.**



## Increasing Operational Capacity

In order to respond to increased demand, suppliers must invest in increased capacity, which comes with risks amidst an uncertain political climate and supply chain issues with critical equipment.

**PAC helps biofuel producers comply with standards and regulations and have a history of successful projects.**



## Controlling Cost of Production

The cost of petroleum-based fuels is comparatively low, which makes it hard for renewables to compete. In fact, biofuels often require subsidies to compete effectively with fossil fuels.

**PAC helps biofuel producers minimize operational costs, produce efficiently, and maximize uptime.**

# World-Class Products & Solutions



## JFTOT VI

Includes enhanced safety features and simplified operational capabilities through accurate and reliable jet fuel analysis, with a small-footprint design.



## OptiReader

Offers accurate and fast results through an Ellipsometric jet fuel thermal oxidation heater tube scanner, with excellent data integration capabilities.



## JFA-70Xi

Performs freeze point, density, and viscosity in one self-cleaning unit. Features a new, side loaded automatic sample injection port.



## Mid Distillates Analyze/Custom GC

Incorporates high-performance liquid chromatography (HPLC) technology to detect aromatics in jet fuel in the 150°C to 400°C (752°F) range within 25 minutes.



## ElemenTs

Detects Total Sulfur and/or Total Nitrogen efficiently using ultraviolet fluorescence (UVF) and chemiluminescence (CLD) in solid, liquid, gaseous materials and LPG samples.



## FAME in Avtur Analyzer

Measures FAME (biodiesel) in jet fuel and features a unique combination of Deans switching. This gas chromatography application includes a re-focus module that eliminates the need for cryogenics.



## Custom GC\*GC

Provides detailed and reliable compositional information on jet fuel streams.



## OptiFuel: FTIR Fuel Analyzer

Combines the capabilities of GS PPA, TD PPA and QuickSpec into one instrument to determine the concentration content of wide varieties of FAME in diesel fuel.



## BioDiesel All-in-One

Determines the quality of FAME blending stock for diesel fuel, and yields fast results from a single dedicated system.



## CID 510 (Cetane Ignition Delay)

Provides the best precision in the market for determining the Derived Cetane Number of all types of diesel fuel, biodiesel, FAME, HVO, BTL, and GTL.



## DFA-70Xi – Cloud Point & Viscosity

Performs four diesel fuel tests in one single unit—cloud point, pour point, viscosity and density, and does it all in less than 25 minutes. (The only instrument in the world to do this.)



## OptiFlash

Detects flashpoint accurately up to 400°C for petroleum products, biodiesels, solvents, chemicals, fluxed bitumen, and food and beverages.



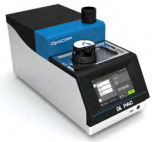
## OptiDist: Atmospheric Distillation

Offers precision and ease of use in a state-of-the-art solution for performing atmospheric distillation.



## OptiPMD: Micro-Distillation

Determines the boiling range characteristics of fuel products in less than 10 minutes, using only 10 ml of sample.



### OptiCPP: Cloud and Pour Point

Performs pour and/cloud point testing of any petroleum products, down to  $-95^{\circ}\text{C}$  ( $-139^{\circ}\text{F}$ ), in accordance with all international standards.



### OptiMPP: Mini Cloud and Pour Point

Provides highly accurate cloud and pour point temperatures of petroleum products during cooling.



### MicroDist

Determines the boiling range characteristics of various commercially available fuel products, light and middle distillates, on process streams quickly and accurately.



### SIMDIS

Offers a complete range of simulated distillation analysis solutions up to  $120^{\circ}\text{C}$ .



### Reformulyzer M4 (up to E85)

Delivers fast, group-type analysis of gasoline and gasoline blend streams using multi-dimensional gas chromatography.



### Custom GC (D5501)

Allows the AC Analytical Controls gas chromatograph to be customized to fit your specific analysis requirements.

# Global Strategies for Renewable Fuel Sources

The demand for renewable fuels is increasing, as nations around the world recognize the impact of fossil fuels on climate change and greenhouse gas emissions. Transport sectors, including aviation, heavy-duty and light-duty vehicles, and even marine, have invested in equipment and technologies that accommodate renewable fuels. These include sustainable aviation fuel (SAF), renewable diesel (HOV), biodiesel, and ethanol. Some are even considering hydrogen as a renewable fuel.

## **SUSTAINABLE AVIATION FUEL** ▶

PAC offers an extensive product portfolio with industry-proven and ASTM-compliant solutions for aviation fuels, including elemental analysis, physical properties, fuel composition, and gas chromatography.

## **HYDROGEN AS A RENEWABLE FUEL** ▶

PAC has developed a number of applications based on gas chromatography to analyze the impurities in hydrogen, including tests for CO, CO<sub>2</sub>, hydrocarbons, helium, nitrogen, argon, and total and speciated sulfur compounds.

## **ETHANOL** ▶

PAC's ethanol solutions allow producers to improve their production process, increase yields, and maximize efficiency. As the global leader in advanced analytical instruments, PAC ensures compliance to D4814, EN 288, D4806, and D5798.

## **BIODIESEL** ▶

PAC's analyzers are the industry standard for monitoring fuel properties. Our analyzers determine FAME content, free and total glycerin, viscosity, cetane number, cloud point, and other properties.

## **RENEWABLE DIESEL** ▶

PAC has instruments to support renewable diesel applications for a wide range of parameters, including cetane, cloud and pour points, viscosity, flash point, sulfur, distillation, and more.

# Service & Support

PAC offers service and support options to ensure the performance, reliability, and longevity of our products. Whether you require preventative maintenance, calibration and startup, or emergency services, PAC's team of expert technicians will keep your equipment running at optimum levels.

## Repair & Maintenance

PAC offers individual services for preventative maintenance, calibration, and relocation services. All our service repair facilities have the technology and know-how necessary to inspect, repair and calibrate your PAC equipment. All work is performed by our factory trained and certified technicians who use only approved spare parts to guarantee your instrument performance.

## Field Services

Our on-site customer services include installation and commissioning of equipment, as well as emergency site visits. All services are performed by experienced, qualified PAC service representatives who have successfully completed PAC's rigorous training and certification program.

## Total Care Service Programs

We have two service programs to fit the unique needs of our customers.

Features & Benefits	Basic Care	Complete Care
Priority response/repair	✓	✓
Pre-scheduled PM & Performance Verification Certificate	1 Visit	1 Visit
Onsite PM Travel Cost	1 Visit	1 Visit
Repair Parts Cost		Unlimited
Repair Travel Cost		Unlimited
Customer training	10% discount	10% discount
Hardware/software updates		As needed

## ABOUT PAC

PAC develops advanced instrumentation for lab and process applications based on strong Analytical Expertise that ensures Optimal Performance for our clients. Our analyzers help our clients meet complex industry challenges by providing a low cost of ownership, safe operation, high performance with fast, accurate, and actionable results, high uptime through reliable instrumentation, and compliance with standard methods.

Our solutions are from industry-leading brands: AC Analytical Controls, Advanced Sensors, Alcor, Antek, Herzog, ISL, Cambridge Viscosity, PSPI, PetroSpec, and Phase Technology. We are committed to delivering superior and local customer service worldwide with 16 office locations and a network of over 50 distributors. PAC operates as a unit of Roper Technologies, Inc., a diversified technology company and a constituent of S&P 500, Fortune 1000, and Russell 1000 indices.

## HEADQUARTERS

PAC LP  
8824 Fallbrook Drive  
Houston, Texas 77064  
USA

For further information, visit us online at <http://pacip.com>