CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Petroleum Analyzer Company, LP
8824 Fallbrook Drive
Houston, TX 77064

Fulfills the requirements of

ISO/IEC 17025:2017

In the fields of

CALIBRATION and **TESTING**

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 21 December 2022
Certificate Number: ACT-2646

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Petroleum Analyzer Company, LP
8824 Fallbrook Drive
Houston, TX 77064
Matthew R. Berg
Matthew.berg@paclp.com 281-653-5031

TESTING AND CALIBRATION

Valid to: **December 21, 2022** Certificate Number: **ACT-2646**

TESTING

Chemical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Analytical Instrumentation Verification	ASTM 5453, ASTM D5504, ASTM D5623, ASTM D7011, ASTM D7183, ASTM D7551, ASTM D7359, ASTM D7994, ASTM D3241, EN 15486, IP 323, ISO 6249 ISO 19739, EN-ISO 20846, UOP 791	Gas and Oil Analytical Instrumentation	MultiTek, JFTOT: Electronics, Ellipsometry
Thermal Oxidation – Jet Fuel	ASTM D3241, IP 323, ISO 6249, DEF STAN 91-091	Jet Fuel	JFTOT: Jet Fuel Thermal Oxidation Tester
Elemental Analysis - Nitrogen	ASTM D4629, ASTM D5176	Oil and Gas	MultiTek: Chemiluminescence
Elemental Analysis - Sulfur	ASTM D5453, EN-ISO 20846, ASTM D6667	Oil and Gas	MultiTek: UV Fluorescence, Ion Chromatography
Freezing Point Analysis	ASTM D7153, MIL DTL - 5624V, ISO 3013	Oil and Gas	OptiFZP: Automatic Freezing Point Analyzer
Viscosity	ASTM D7945, ASTM D445	Oil and Gas, Diesel fuel/biofuels, Asphalt, Lubricants.	ViscoSure, VP 2000, VP 2100, JFA-70Xi, MFA-70Xi, DFA-70Xi, HVM 472, HVU 481, HVU 482: Viscometer (Glass Capillary, Constant Pressure)
Evaporation Loss of Lubricating Oils	ASTM D5800	Lubrication oils	NCK2 5G: Thermal Evaporation
Viscosity	ASTM D7279	Used oils and lubricants	VH1, VH2: Glass Capillary

Chemical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Vapor Pressure	ASTM D323, D4953, D5191EN13017, IP394, IP481	Automotive and aviation gasoline	HVP-972: Vapor pressure at Temperature
Density	ASTM D4052	Petroleum products	VIDA 40: Vibrational U-Tube
Softening point	ASTM D36	Bitumen, pitch, tar, tall oil rosins, polymer resins	RB 36, HRB 754: Heated Liquid Bath

CALIBRATION

Chemical Quantities

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
PPM Nitrogen, Sulfur	(0 to 20) ppm Concentration (0 to 1 000) ppm Concentration	1.2 ppm Concentration 2.6 ppm Concentration	CRM (Nitrogen, Sulfur), MultiTek Horizontal N

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Voltage – Measure	(1 to 10) V (10 to 100) V (100 to 1 000) V	0.007 V 0.063 V 1.7 V	Fluke 87V Multimeter

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Atmospheric Pressure Correction	(0 to 200) kPa	0.16 kPa	Handheld Manometer (M1)
System Pressure	(0 to 600) psi	4.3 psi	Pressure Gauge
Balance and Scale[1]	(1 to 200) g	0.02 g	ASTM Class 3 Weight
Volumetric Height Measuring Devices	(0 to 200) mm	0.23 mm	Volumetric Calibration Gauge (Steel, 5202-004-003)

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Flow Rate	(0 to 500) SCCM	0.58 SCCM	Flask, Timer
Torque	(0.17 to 100) lbf·ft	3.5 lbf·ft	Torque Wrench

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature Circuit Simulation	(-50 to 0) °C (0 to 100) °C (100 to 400) °C	0.31 °C 0.22 °C 0.65 °C	Probe Simulators PS100, PS400 Temperature Probe Simulator Based on Resistance
PRT Probe	(-10 to 375) °C	0.22 °C	Fluke 9100s, Digital Thermometer with PRT Probe
Type K Thermocouple	(Up to 380) °C	0.59 °C	Reference Thermocouple

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RPM/Speed	(0 to 500) rpm	0.64 rpm	Tachometer

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 (k=2), corresponding to a confidence level of approximately 95%.

Notes:

1. The CMC for scales and balances are highly dependent upon the resolution of the unit under test. The uncertainty presented here does not include the resolution of the unit under test. The resolution will be included in the reported measurement uncertainty at the time of calibration.
2. This scope is formatted as part of a single document including Certificate of Accreditation No. ACT-2646.

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