Scope of Accreditation
For
Graftel, LLC

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In recognition of a successful assessment to ISO/IEC 17025:2005, ANSI/NCSL Z540-1:1994 (R2002), and ANSI/NCSL Z540.3:2006 sub clause 5.3 to the following Calibration and Measurement Capabilities, accreditation has been granted to **Graftel, LLC** for the following:

Accreditation granted through: **March 28, 2017**

Calibration

Mass - Flow

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Gas Flow Rate	200 sccm to 6 slm	0.15 % of reading	Balance and timer – Gravimetric method
	1 sccm to 24 slm	0.28 % of reading	Flow Tubes
	(24 to 141 584) slm	0.21 % of reading	Sonic Nozzles
Gas Flow Rate [1]	1 sccm to 1500 slm	0.5 % of reading	Laminar Elements
	(205 to 1 415) slm (566 to 4 247) slm (3 029 to 17 546) slm	0.46 % of reading 0.46 % of reading 0.46 % of reading	Coriolis Flow Systems
Liquid Flow Rate	5 to 500 gpm	0.75 % of reading	Tracer Method
Liquid Flow Rate[1]	5 to 100 000 gpm	0.75 % of reading	Tracer Method
Liquid Flow Rate	1 ccm to 300 lpm	0.06 % of reading	Weighing Method
	(300 to 1 800) lpm	0.064 % of reading	Gravimetric method
Liquid Flow Rate [1]	(0.06 to 400) lpm	0.1 % of reading	Coriolis Flow System
	(2 to 48) in lines	1 % of reading	Ultra Sonic Flow Meters
Air Velocity	(2 to 50) m/s	0.5 % of reading	Wind Tunnel Pitot Tube
	(0.5 to 50) m/s	1 % of reading	Sonic Nozzles
	(2 to 50) m/s [1]	0.5 % of reading	Pitot Tube
	(2 to 45) m/s [1]	2.2 % or reading	3D Ultrasonic Anemometer

Electrical – Current

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
DC Current-Measure[1]	(0 to 200) µA (0.2 to 2) mA (2 to 20) mA (20 to 200) mA (0.2 to 2) A	0.042 % rdg + 0.02 µA 0.023 % rdg + 0.2 µA 0.056 % rdg + 8 µA 0.041 % rdg + 32 µA 0.12 % rdg + 0.8 mA	Fluke 8808A Digital Multimeter

Electrical – Resistance

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Resistance Measurement[1]	(0 to 200) Ω (0.2 to 2) kΩ (2 to 200) kΩ (0.2 to 2) MΩ	0.036 % rdg + 0.016 Ω 0.037 % rdg + 0.069 Ω 0.042 % rdg + 0.012 Ω 0.095 % rdg + 0.070 Ω	Fluke 8808A Digital Multimeter

Electrical – Voltage

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
DC Voltage-Measure[1]	(0 to 200) mV (0.2 to 2) V (2 to 20) V (20 to 200) V	0.18 % rdg + 0.009 mV 0.020 % rdg + 0.12 mV 0.040 % rdg + 1.6 mV 0.026 % rdg + 12 mV	Fluke 8808A Digital Multimeter

Mass – Pressure/Low Vacuum

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Pressure	(1.7 to 100) psi	0.001 % of rdg + 0.0004 psi	Ruska 2465 Deadweight Pressure Calibrator
	(2 to 1 000) psi	0.0026 % of rdg + 0.0004 psi	
Pressure[1]	(500 to 1 100) hPa	0.25 hPa	Vaisala Pressure Transducer
	(0 to 100) psia (100 to 1 000) psia	0.11 psia 0.45 psia	Paroscientific 760 Pressure Transmitter
Differential Pressure[1]	(-250 to -30) inH_2O @ 4 °C (-30 to -10) inH_2O @ 4 °C (-10 to 0.025) inH_2O @ 4 °C (0.025 to 10) inH_2O @ 4 °C (10 to 30) inH_2O @ 4 °C (30 to 250) inH_2O @ 4 °C	0.11 % of reading 0.018 % of reading 0.018 % of reading 0.019 % of reading 0.019 % of reading 0.018 % of reading	Fluke 7252i

Thermodynamics – Humidity

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Relative Humidity	(10 to 95) % RH	1.1 % RH	Thunder Scientific 1200

Thermodynamics – Thermometers and Probes

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Temperature[1]	(-80 to 95) ºC	0.023 °C	Temperature Baths & PRT
Dew Point Temperature	(-80 to -20) ºC	0.22 ºC	Two Temperature Generator & PRT
	(-20 to 50) ºC	0.2 ºC	Thunder Scientific 1200

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and remarks. 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) Laboratory offers calibration services at the laboratory's own facilities and at the client or other agreed upon facilities.

Approved by: _____ Date: October 7, 2015

R. Douglas Leonard
Chief Technical Officer