INTERNATIONAL ACCREDITATION SERVICE®

CERTIFICATE OF ACCREDITATION

This is to attest that

VERTEX CALIBRATION

OFFICE NO.9, 2ND FLOOR, BUILDING NO. 242, C-RING ROAD
DOHA 1291, QATAR

Calibration Laboratory CL-226

has met the requirements of AC204, *IAS Accreditation Criteria for Calibration Laboratories*, and has demonstrated compliance with the ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation maintained on the IAS website (www.iasonline.org).

This certificate is valid up to November 1, 2020.

(See laboratory's scope of accreditation for fields of calibration and accredited calibration.)

This accreditation certificate supersedes any IAS accreditation bearing an earlier effective date. The certificate becomes invalid upon suspension, cancellation or revocation of accreditation. See www.iasonline.org for current accreditation information, or contact IAS at 562-364-8201.

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Raj Nathan
President

18-15965

SCOPE OF ACCREDITATION

IAS Accreditation Number	CL-226
Accredited Entity	Vertex Calibration
Address	Office No.9, 2nd Floor, Building No. 242, C-Ring Road Doha 1291, Qatar
Contact Name	Ronaldo Acosta
Telephone	+974 4 017 2172
Effective Date of Scope	October 28, 2019
Accreditation Standard	ISO/IEC 17025:2017

CALIBRATION AND MEASUREMENT CAPABILITY (CMC)[1,2]

CALIBRATION AREA	RANGE	EXPANDED UNCERTAINTY[3] (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT
Dimensional			
Micrometer (Mechanical/ Electronic)	0 mm to 150 mm	1.9 µm	Gauge Block Set, optical parallel and optical flat
Caliper (Vernier / Dial / Electronic)	0 mm to 150 mm 0 mm to 300 mm	7.2 µm 9.1 µm	Gauge Block Set, caliper checker
Thickness Gauge (Dial / Digital)	0.001 mm to 100 mm	16 µm	Gauge Block Set
Dial Indicator / gauge	0.001 mm to 100 mm	2.9 µm	Dial Test Calibrator and Gauge Block Set
Depth Gauges	0.001 mm to 100 mm	2.1 µm	Gauge Block set
Feeler Gauge	Up to 2 mm	2.5 µm	Digital Outside Micrometer
Coating Thickness Gauge (Ferrous and Non-Ferrous)	0 µm to 1496 µm	1.3 µm	Thickness Standards
Sieves	2 mm to 125 mm	89 µm	Digital Caliper
Mechanical			
Sound Pressure Level (SPL)	94 dB and 114 dB (at 1 kHz)	1.6 dB	Sound Level Calibrator
Volume	5 µL to 1000 µL 1 mL to 500 mL 500 mL to 2000 mL	0.15 µL 80 µL 100 µL	Balance and E2 Class Weights, Gravimetric method
Compression Machine	0.1 kN to 100 kN 0.1 kN to 3000 kN	0.18 % 0.15 %	100kN, 3000kN Load Cell with Indicator
Torque Wrench / Torque Meter	0.1 N·m to 400 N·m 0.1 N·m to1500 N·m	0.64 % 0.63 %	Norbar make torque calibration system with transducer
Weighing balance	1 mg to 200 g 200 g to 2 kg 2 kg to 10 kg 10 kg to 300 kg	0.15 mg 1.2 mg 4.1 mg 1.4 g	Standard weights (E2 Class) Calibration of Electronic weighing balance of Class I and coarser as per OIML R-76-1

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Batching plant scale	10 kg to 300 kg	56 g	Standard weights (M1 Class) Class II and coarser as per OIML R-76-1
Reference standard weights	1 mg to 500 mg. 1 g to 500 g 1 kg to 20 kg	0.09 mg 8.8 mg 870 mg	Standard weights (E2 Class) and Electronic weighing
Hydraulic Pressure Gauge (Dial / Digital)	1 bar to 60 bar 50 bar to 1000 bar	0.17 % 0.17 %	Dead Weight Tester with two piston-cylinder assemblies by the method of comparison following DKD-R6-1
	0.1 bar to 700 bar	0.47 %	Master Digital Pressure Gauge and Pressure Comparator as per DKD–R6–1
Dial Vacuum Gauges, Digital Vacuum Gauges, Digital Vacuum Calibrators, Vacuum Switches, Vacuum, Transmitters / Pressure Relief Valve	-1 mbar to -0.9 bar	0.0081 bar	Digital Pressure / Vacuum calibrator as per DKD–R6–1
Absolute Pressure (Pneumatic), Absolute Pressure Gauge, Manometer, Barometer, Pressure Calibrators, Pressure Transmitters	200 mbar to 2000 mbar	11.6 mbar	Absolute pressure calibrator as per DKD–R6–1
Centrifuge / RPM Measurement	5 rpm to 99000 rpm	550 rpm	Digital Tachometer by comparison method

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CALIBRATION AREA	RANGE	EXPANDED UNCERTAINTY[3] (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT
Thermal			
Water Bath	5 °C to 95 °C	0.90 °C	12 Channel Temperature Meter and master sensor with single or multi-position calibrator
Oven (one-point calibration)	30 °C to 250 °C	1.3 °C	
Incubator	5 °C to 95 °C	0.76 °C	
Storage Room	20 °C to 50 °C	0.67 °C	
Cold Storage Room	–18 °C to 20 °C	0.76 °C	
Freezer	–25 °C to 0 °C	2.0 °C	
Chiller	0 °C to 10 °C	0.75 °C	
Furnace	300 °C to 1000 °C	4.6 °C	
Temperature Block / bath / dry block	-40 °C to 400 °C 400 °C to 1000 °C 600 °C to 1200 °C	1.0 °C 2.0 °C 2.0 °C	Druck Multifunction Calibrator plus Master Thermocouple
Infrared Thermometer / Pyrometer	35 °C to 500 °C	1.9 °C	Black Body Calibrator
RTD / Thermocouple / Temp. Indicator with sensor / Temperature Gauges	-35 °C to 650 °C	0.45 °C	Dry Block Calibrator, (Low and high range), Multifunction Calibrator
Electrical / DC / Low Frequency			
DC Voltage Source[4]	0.1 mV to 330 mV 330 mV to 330 V 330 V to 1000 V	1.8 % 0.01 % 0.01 %	Fluke Multi–Product calibrator model 5522A Direct Method
DC Current Source[4]	10 µA to 330 µA 330 µA to 3.3 mA 3.3 mA to 1.0 A 1.0 A to 10 A 10 A to 20 A	0.25 % 0.03 % 0.037 % 0,07 % 0.12 %	Fluke Multi–Product Calibrator Model 5522A, Direct Method
	20 A to 400 A 400 A to 1000 A	0.87 % 1.3 %	Current coil Direct Method
AC Voltage Source[4]	(10 Hz to 500 kHz) 1 mV to 33 mV 33 mV to 330 mV 330 mV to 3.3 V (10 Hz to 100 kHz) 3.3 V to 33 V (50 Hz to 20 kHz) 33 V to 330 V (50 Hz to 10 kHz) 330 V to 1000 V	 1.3 % 1.1 % 0.30 % 0.11 % 0.03 % 0.037 %	Fluke Multi–Product Calibrator Model 5522A, Direct Method Fluke Multi–Product Calibrator Model 5522A, Direct Method

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CALIBRATION AND MEASUREMENT CAPABILITY (CMC)[1,2]

CALIBRATION AREA	RANGE	EXPANDED UNCERTAINTY[3] (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT
AC Current Source[4]	(10 Hz to 30 kHz) 30 µA to 330 µA 330 µA to 330 mA (10 Hz to 10 kHz) 0.33 A to 1.1 A 1.1 A to 3 A (50 Hz to 5 kHz) 3 A to 11 A 11 A to 20 A	 0.67 % 0.67 % 0.54 % 0.72 % 0.73 % 0.25 %	Fluke Multi–Product Calibrator Model 5522A, Direct Method
	(50 Hz) 20 A to 400 A 400 A to 1000 A	 0.35 % 1.3 %	Current coil Direct Method
Resistance Source[4]	0.1 Ω to 330 kΩ 330 kΩ to 11 MΩ 11 MΩ to 110 MΩ 110 MΩ to 1100 MΩ	0.12 % 0.018 % 0.062 % 1.7 %	Fluke Multi–Product calibrator model 5522A, Direct Method (2 wire and 4 wire)
Frequency Source[4]	1 Hz to 2 MHz	0.014 %	Fluke Multi–Product Calibrator Model 5522A, Direct Method
Capacitance Source[4]	(10 Hz to 10 kHz) 0.5 nF to 330 nF (10 Hz to 600 Hz) 0.33 µF to 330 µF (0 Hz to 20 Hz) 0.33 mF to 110 mF	 2.9 % 0.65 % 3.9 %	Fluke Multi–Product Calibrator Model 5522A, Direct Method
Temperature Simulation (Temperature Indicator / Controller / Recorder / Test Kit / Calibrators / Multimeter Source) RTD (Pt–100, Pt–200, Pt–500, Pt–1000)	–200 °C to 600 °C	0.07 °C	Fluke Multi–Product Calibrator Model 5522A, Direct Method

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CALIBRATION AND MEASUREMENT CAPABILITY (CMC)[1,2]

CALIBRATION AREA	RANGE	EXPANDED UNCERTAINTY[3] (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT
Temperature Simulation continued			Fluke Multi–Product Calibrator Model 5522A, Direct Method
Thermocouple			
Type B	600 °C to 1820 °C	0.87 °C	
Type C	0 °C to 2316 °C	1.2 °C	
Type E	–250 °C to 1000 °C	0.67 °C	
Type J	–210 °C to 1200 °C	0.76 °C	
Type K	–200 °C to 1372 °C	0.49 °C	
Type L	–200 °C to 900 °C	0.55 °C	
Type N	–200 °C to 1300 °C	0.78 °C	
Type R	0 °C to 1767 °C	0.86 °C	
Type S	0 °C to 1767 °C	0.89 °C	
Type T	–250 °C to 400 °C	0.81 °C	
Type U	–200 °C to 600 °C	0.73 °C	
DC Voltage Measure[5]	1 mV to 10 mV 10 mV to 1000 V	0.48 % 0.05 %	6 ½ Digit Multimeter
AC Voltage Measure[5] @ 50 Hz	1 mV to 10 mV 10 mV to 1000 V	4.7 % 0.54 %	6 ½ Digit Multimeter
DC Current Measure[5]	10 μA to 100 mA 100 mA to 1 A 1 A to 10 A	0.38 % 0.089 % 0.18 %	6 ½ Digit Multimeter
AC Current Measure[5] @ 50 Hz	10 μA to 0.33 A 1 A to 10 A	0.42 % 0.59 %	6 ½ Digit Multimeter
DC Resistance Measure[5]	1 Ω to 1 kΩ 1 kΩ to 10 MΩ 10 MΩ to 1 GΩ	0.36 % 0.048 % 2.4 %	6 ½ Digit Multimeter
Frequency Measure[5]	5 Hz to 1 MHz	0.12 %	6 ½ Digit Multimeter
Capacitance Measure[5]	1 nF to 1 μF 1 μF to 100 mF	5.4 % 4.9 %	6 ½ Digit Multimeter
Time / Frequency			
Time (Timer, Stopwatch etc.)	5 s to 3600 s 3600 s to 24 h	0.83 s 1.0 s	Master Stop watch Comparison method

[1]The uncertainty covered by the Calibration and Measurement Capability (CMC) is expressed as the expanded uncertainty having a specific coverage probability of approximately 95 %. It is the smallest measurement uncertainty that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than that provided in the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

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CALIBRATION AND MEASUREMENT CAPABILITY (CMC)[1,2]

CALIBRATION AREA	RANGE	EXPANDED UNCERTAINTY[3] (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT

[2]If information in this CMC is presented in non-SI units, the conversion factors stated in NIST Special Publication 811 “Guide for the Use of the International System of Units (SI)” apply.

[3]When uncertainty is stated in relative terms (such as percent, a multiplier expressed as a decimal fraction or in scientific notation), it is in relation to instrument reading or instrument output, as appropriate, unless otherwise indicated.

[4]Capability is suitable for the calibration of measuring devices in the stated ranges.

[5]Capability is suitable for the calibration of devices intended to generate the measurand in the stated ranges.