

شهادة اعتماد

رقم 011 CL



يقر نظام الاعتماد العراقي بأن:

مختبرات شركة سيتادل الهندسية

العراق - اقليم كردستان - اربيل - القرية الايطالية

تم اعتمادها وفقا لمتطلبات المواصفة ISO/ IEC 17025:2017
(المتطلبات العامة لاهلية مختبرات الفحص والمعايرة)

في مجال:

- معايرة درجة الحرارة
- معايرة الضغط
- معايرة الكتلة
- معايرة الحجم
- معايرة الجريان
- المعايرة الكيميائية
- معايرة الابعاد
- معايرة الكهرباء
- معايرة الزمن والتردد
- معايرة القوة
- معايرة الاهتزاز

شرط التوافق مع متطلبات المواصفة اعلاه ومتطلبات IQAS الخاصة بالاعتماد
مجال الاعتماد المرفق بالشهادة يعتبر جزءا لا يتجزأ منها
يمكن الحصول على الاصدار الاحدث من مجال الاعتماد من خلال الموقع الالكتروني

<https://iqas.mop.gov.iq>

يكون الاعتماد نافذا من 2025/7/30 الى 2027/7/29

تاريخ منح الاعتماد لأول مرة

2019/7/10

لقد
أ.د. محمد علي تميم
نائب رئيس مجلس الوزراء
وزير التخطيط

المهندس
عبد الواحد محمد ابراهيم
مدير عام الهيئة/ وكالة

Ministry of planning
Iraqi Organization for Accreditation
IQAS

ACCREDITATION CERTIFICATE

No. CL 011



Iraqi Accreditation System Certify that:

Citadel Engineering Company Laboratories

Iraq- Kurdistan region- Erbil- Italian Village

Is accredited according to the requirements of the standard ISO/IEC17025:2017
(General Requirements for the Competence of Testing and Calibration Laboratories)

In the field of:

- Temperature Calibration
- Pressure Calibration
- Mass Calibration
- Volume Calibration
- Flow Calibration
- Chemical Calibration
- Dimensional Calibration
- Electricity Calibration
- Time & Frequency Calibration
- Force Calibration
- Vibration Calibration

This accreditation is subject to with the above standard & IQAS requirements
The scope of accreditation is attached to the certificate & considered as part of it
The most recent issue of the accreditation scope is available on IQAS website

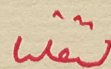
<https://iqas.mop.gov.iq>

Accreditation is valid From 30/7/2025 To 29/7/2027

Initial accreditation date

10/7/2019


Eng. Abdul Wahid M. Ibrahim
Director General of IQAS


Dr. Mohammed Ali Tamim
Deputy Prime Minister
Minister of Planning

	استمارة مجال الاعتماد Scope of Accreditation form	نظام الاعتماد العراقي IQAS
Organization address: Iraq- Kurdistan region- Erbil- Italian Village	Organization name: Citadel Engineering Company Laboratories	Accreditation no.: CL 011
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Calibration Field	Type of Instrument or Material to be Calibrated or Measured	Measurand or reference material	Calibration Method	Measurement Range	Uncertainty (±)	Location
Flow	Prover Base Volume: Pipe Prove Compact Prover Tank Prover (Water)	Water Draw Test Measure	API MPMS 12.2.4 API MPMS 4.9.2 API MPMS 4.3.7	300 gal	0.020 %	Lab / Site
		Water Draw Test Measure		30 gal	0.020%	
		Filed Standard Test Measure Can Prover		25 gal	0.028 %	
		Filed Standard Test Measure Can Prover		20 gal	0.028%	
		Filed Standard Test Measure Can Prover		1 gal	0.028%	
		Filed Standard Test Measure Can Prover		1 L	0.028%	
		Filed Standard Test Measure Can Prover				
	Liquid Flow Meters	Pipe Prover	API MPMS 4.5 API MPMS 4.8	488.3794 L	0.06%	
	Liquid Flow Meters Mass Flow Rate (Water)	Coriolis Flow Meter 2" (CMF200M)	Master Metering Proving Method API MPMS 4.5-	16,000 kg/h to 47,880 kg/h	0.056 % of reading	
		Coriolis Flow Meter 3" (CMF300M)		18,000 kg/h to 180,000 kg/h	0.056 % of reading	

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		Coriolis Flow Meter 4" (F400)	2016 API MPMS 4.8-2013	33,000 kg/h to 329,000 kg/h	0.056 % of reading	
		Coriolis Flow Meter 8" (CMFHC2)		90,000 kg/h to 800,000 kg/	0.046 % of reading	
Flow	Liquid Flow Meters (Volumetric Flow Rate) (water)	Coriolis Flow Meter 2" (CMF200M)	Master Metering Proving	40 L/min to 798 L/min	0.056 % of reading	Lab / Site
		Coriolis Flow Meter 3" (CMF300M)	Method API MPMS 4.5-2016	300 L/min to 3,000 L/min	0.056 % of reading	
		Coriolis Flow Meter 4" (F400)	API MPMS 4.8-2013	550 L/min to 5,483 L/min	0.056 % of reading	
		Coriolis Flow Meter 8" (CMFHC2)		1,500 L/min to 13,333 L/min	0.046 % of reading	
	Liquid Flow Meters Mass Flow Rate (Petroleum)	Coriolis Flow Meter 2" (CMF200M)	Master Metering Proving	16,000 kg/h to 47,880 kg/h	0.056 % of reading	
		Coriolis Flow Meter 3" (CMF300M)	Method API MPMS 4.5-2016	18,000 kg/h to 180,000 kg/h	0.056 % of reading	
		Coriolis Flow Meter 4" (F400)	API MPMS 4.8-2013	33,000 kg/h to 329,000 kg/h	0.056 % of reading	
		Coriolis Flow Meter 8" (CMFHC2)		90,000 kg/h to 800,000 kg/h	0.046 % of reading	
	Liquid Flow Meters (Volumetric Flow	Coriolis Flow Meter 2" (CMF200M)	Master Metering Proving	40 L/min to 798 L/min	0.056 % of reading	

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	Rate) (Petroleum)	Coriolis Flow Meter 3" (CMF300M)	Method API MPMS 4.5- 2016 API MPMS 4.8-2013	300 L/min to 3,000 L/min	0.056 % of reading	
		Coriolis Flow Meter 4" (F400)		550 L/min to 5,483 L/min	0.056 % of reading	
		Coriolis Flow Meter 8" (CMFHC2)		1,500 L/min to 13,333 L/min	0.046 % of reading	
Pressure	Calibration of Vacuum and Pressure Measuring Instruments and Gauges	Fluke Calibrator 721 3605	DKD-R 6-1 DKD-R 6-2 API-526 API-527 EA-10/17 ASME PTC- 25	-0.85 bar to +2.5 bar	0.0009 bar	Lab / Site
		Fluke Calibrator 721 3605		0 bar to 35 bar	0.009 bar	
		Fluke Calibrator 721 3630		0 bar to 200 bar	0.05 bar	
		Fluke Calibrator 718-100G		-10 psi to 100 psi	0.05 psi	
		Pneumatic Dead-Weight Tester Budenberg BGP120		(1 to 120) bar	35 ppm	
		Hydraulic Dead-Weight Tester Budenberg BGH1400		(1 to 71.1) bar (70 to 1400) bar	70 ppm of Rdg 55 ppm of Rdg	
		Additel Pressure 681 Additel 949		(0 to 40,000) psi	0.1% FS	

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	Pressure Safety Valve	HASKEL Bench Test		(0 to 1200) bar (water) (0 to 700) bar (N2)	0.1% FS		
Electricity	Equipment To Output DC Voltage	Fluke 8846A	OEM Manual, Euramet cg-15	100 mV	1.30E-03 mV	Lab / Site	
				1 V	5.90E-06 V		
				10 V	4.40E-05 V		
				100 V	6.70E-04 V		
				1000 V	8.10E-03 V		
		1 - 15 KV		1 % of Rdg			
	Equipment To Output AC Voltage	Fluke 8846A		100mV	10 Hz	4.00E-02 mV	
				100mV	20 kHz	1.60E-02 mV	
				1V	10 Hz	3.10E-04 V	
				1V	20 kHz	5.60E-05 V	
				10 V	10 Hz	3.20E-03 V	
				10 V	20 kHz	5.40E-04 V	
				100 V	10 Hz	6.20E-03 V	
				100 V	20 kHz	1.00E-02 V	

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				1000 V	45 Hz	1.10E-01 V	
				1000 V	1 kHz	1.10E-01 V	
				1000 V	20 kHz	6.00E-02 V	
		High Voltage Probe Fluke 80K-40		28 kV	50 Hz	1 % of Rdg	
Electricity	Equipment To Output Resistance	Fluke 8846A	OEM Manual, Euramet cg-15	10 Ω	2.70E-04 Ω	Lab / Site	
				100 Ω	1.10E-03 Ω		
				1 kΩ	9.50E-06 kΩ		
				10 kΩ	9.50E-05 kΩ		
				100 kΩ	1.20E-03 kΩ		
				1 MΩ	2.20E-05 MΩ		
				10 MΩ	4.30E-04 MΩ		
	100 MΩ	1.10E-02 MΩ					
	1 G Ω	2.00E+00 MΩ					
	Equipment To Output DC Current	Fluke 8846A	OEM Manual, Euramet cg-15	100 μA	1.00E-02		
				1 mA	4.30E-05		
10 mA				4.30E-05			
100 mA				3.90E-04			

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				400 mA	9.20E-02		
				1 A	2.10E-04		
Electricity	Equipment To Output DC Current	Fluke 8846A	OEM Manual, EURAMET cg-15	3 A	3.90E-04 A	Lab / Site	
				10 A	4.50E-03 A		
				(10~40) A	2.3%+50mA		
				(40~1000) A	2.3%+500m A		
	Equipment To Output AC Current	Fluke 8846A	OEM Manual, EURAMET cg-15	100 µA	50 Hz - 1 kHz	2.30E -02 µA	
				1 mA	50 Hz - 1 kHz	1.70E -04 mA	
				10 mA	50 Hz - 1 kHz	1.80E -03 mA	
				100 mA	50 Hz - 1 kHz	1.70E -02 mA	
				400 mA	50 Hz - 1 kHz	1.40E -01 mA	
				1 A	50 Hz - 1 kHz	3.10E -04 A	
				1.9 A	50 Hz - 1 kHz	5.50E -04 A	

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				10 A	50 Hz - 1 kHz	5.00E-03 A	
		Fluke 375		40 A	(45~65)Hz	2.3%+50m A	
					(65~400)Hz	2.9%+50m A	
				1000 A	(45~65)Hz	2.3%+500 mA	
				(65~400)Hz	2.9%+500m A		
Electricity	Equipment To Output Frequency	Fluke 8846A	OEM Manual, EURAMET cg-15	10 Hz	1.20E-05 Hz	Lab / Site	
				40 Hz	1.20E-04 Hz		
				300 kHz	1.20E-03 kHz		
				1000 kHz	1.20E-03 kHz		
	Equipment To Output Capacitance	Fluke 8846A	OEM Manual, EURAMET cg-15	100 pF to 1 nF	0.00E+00 nF		
				1 nF to 10 nF	1.20E-02 nF		
				10 nF to 100 nF	3.20E-02 nF		

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				100 nF to 1μF	3.20E-01 μF	
				1 μF to 10 μF	3.20E-03 μF	
				10 μF to 100 μF	3.10E-02 μF	
				100 μF to 1 mF	4.70E-01 mF	
				1 mF to 10 mF	4.50E-03 mF	
				10 mF to 100 mF	4.50E-02 mF	
Electricity	Equipment to Measure DC Voltage	Fluke 5080A	OEM Manual, EURAMET cg-15	Up to 329.999 mV	0.19 mV/V + 17 μV	Lab / Site
				0.33 V to 3.299 99 V	0.14 mV/V + 26 μV	
				3.3 V to 32.999 9 V	0.14 mV/V + 260 μV	
				10 V to 329.999 V	0.17 mV/V + 3 mV	
				100 V to 1020 V	0.17 mV/V + 10 mV	
	Equipment to Measure DC	Fluke 5080A	OEM Manual, EURAMET	Up to 329.99 μA	1.2 mA/A + 0.17 μA	

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	Current		cg-15	0.33 mA to 3.29 mA	1 mA/A+ 0.43 μ A	
				3.3 mA to 32.9 mA	0.8 mA/A + 2.17 μ A	
				33 mA to 329.99 mA	0.8 mA/A + 28.58 μ A	
				0.33 A to 1.099 9 A	2.4 mA/A + 381.05 μ A	
				1.1 A to 2.999 9 A	3.1 mA/A + 381.05 μ A	
				3 A to 10.999 A	4 mA/A + 4.33 mA	
				3 A to 10.999 A	8.3 mA/A + 6.5 mA	
				11 A to 20.500 A	1.2 mA/A + 0.17 μ A	
Electricity	Equipment to Measure DC Current	Fluke 5080A Via 50-Turn Current Coil	OEM Manual, EURAMET cg-15	16 A to 55 A	0.59 % of reading + 19 mA	Lab / Site
				55 A to 150 A	0.62 % of reading + 19 mA	
				150 A to 550 A	0.71 % of reading + 217 mA	
				550 A to 1 025 A	1.13 % of reading + 325 mA	
	Equipment to Measure	Fluke 5080A	OEM Manual, EURAMET	0 Ω	0.02 Ω	

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	Resistance, Fixed points		cg-15	1 Ω	1.70%	
				1.9 Ω	0.90%	
				10 Ω	0.30%	
				19 Ω	0.20%	
				100 Ω	0.10%	
				190 Ω	0.10%	
				1 000 Ω	0.10%	
				1.9 k Ω	0.10%	
				10 k Ω	0.10%	
Electricity	Equipment to Measure Resistance, Fixed points	Fluke 5080A	OEM Manual, EURAMET cg-15	19 k Ω	0.10%	Lab / Site
				100 k Ω	0.10%	
				190 k Ω	0.10%	
				1 M Ω	0.10%	

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				1.9 MΩ	0.10%	
				10 MΩ	0.20%	
				19 MΩ	0.24%	
				100 MΩ	0.20%	
				190 MΩ	1.70%	
	Equipment to Measure Insulation Resistance	Fluke 5080A Meg Option	OEM Manual, EURAMET cg-15	(10.00~999.9) kΩ	0.2%	
				(1.000~9.999) MΩ	0.3%	
				(10.00~999.9) MΩ	0.6%	
				(1.000~10.050)GΩ	1%	
				18.24 GΩ	3%	
Electricity	Equipment to Measure AC Voltage At The Listed Frq.					Lab / Site
	45 Hz to 65 Hz	Fluke 5080A	OEM Manual, EURAMET cg-15	1 mV to 32.99 mV	5.1 mV/V + 104 μV	
	65 Hz to 1 kHz			1 mV to 32.99 mV	5.5 mV/V + 104 μV	

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	45 Hz to 65 Hz			33 mV to 329.99 mV	2.3 mV/V + 312 μ V	
	65 Hz to 1 kHz			33 mV to 329.99 mV	2.4 mV/V + 312 μ V	
	45 Hz to 65 Hz			0.33 V to 3.299 9 V	1.8 mV/V + 3.12 mV	
	65 Hz to 1 kHz			0.33 V to 3.299 9 V	1.9 mV/V + 3.12 mV	
	45 Hz to 65 Hz			3.3 V to 32.999 V	1.6 mV/V + 31.18mV	
	65 Hz to 1 kHz			3.3 V to 32.999 V	1.9 mV/V + 31.18 mV	
	45 Hz to 65 Hz			33 V to 101.99 V	2 mV/V + 31.18mV	
	65 Hz to 1 kHz			33 V to 101.99 V	2.2 mV/V + 31.18mV	
	45 Hz to 65 Hz			102 V to 329.99 V	2.1 mV/V + 31.18 mV	
	65 Hz to 1 kHz			102 V to 329.99 V	2.3 mV/V + 31.18 mV	
	45 Hz to 65 Hz			330 V to 1020 V	2.1 mV/V + 311.77 mV	
	65 Hz to 1 kHz			330 V to 1020 V	2.3 mV/V + 311.77 mV	
Electricity	Equipment To Measure AC Current At The Listed Frq.					Lab / Site
	45 Hz to 65 Hz	Fluke 5080A	OEM Manual, EURAMET cg-15	Up to 29 μ A	4.2 mA/A + 1.3 μ A	
	65 Hz to 1 kHz			Up to 29 μ A	4.5 mA/A + 1.3 μ A	
	45 Hz to 65 Hz			29 μ A to 329.9 μ A	3.6 mA/A + 1.3 μ A	
	65 Hz to 1 kHz			29 μ A to 329.9 μ A	3.8 mA/A + 1.3 μ A	

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	45 Hz to 65 Hz			0.33 mA to 3.299 9 mA	3.2 mA/A + 1.56 μ A	
	65 Hz to 1 kHz			0.33 mA to 3.2999 mA	3.3 mA/A + 1.56 μ A	
	45 Hz to 65 Hz			3.3 mA to 32.999 mA	0.9 mA/A + 20.78 μ A	
	65 Hz to 1 kHz			3.3 mA to 32.999 mA	2.7 mA/A + 20.78 μ A	
	45 Hz to 65 Hz			33 mA to 329 mA	1.5 mA/A + 207.85 μ A	
	65 Hz to 1 kHz			33 mA to 329 mA	2.8 mA/A + 207.85 μ A	
	45 Hz to 65 Hz			0.33 A to 1.099 9 A	1.5 mA/A + 2.6 mA	
	65 Hz to 1 kHz			0.33 A to 1.099 9 A	4 mA/A + 2.6 mA	
	45 Hz to 65 Hz			1.1 A to 2.999 9 A	1.5 mA/A + 2.6 mA	
	65 Hz to 1 kHz			1.1 A to 2.999 9 A	4 mA/A + 2.6 mA	
	45 Hz to 65 Hz			3.0 A to 10.999 A	3.6 mA/A + 10.39 mA	
	65 Hz to 1 kHz			3.0 A to 10.999 A	5.7 mA/A + 10.39 mA	
	45 Hz to 65 Hz			11 A to 20.500 A	7.1 mA/A + 10.39 mA	
	65 Hz to 1 kHz			11 A to 20.500 A	8.5 mA/A + 10.39 mA	
Electricity	Equipment To Measure AC Current At The Listed Frq.					Lab / Site
	45 Hz to 65 Hz	Fluke 5080A Via 50-Turn Current Coll	OEM Manual, EURAMET cg-15	16.5 A to 55.0 A	0.6 % of Output + 104 mA	
	65 Hz to 440 Hz			16.5 A to 55.0 A	1.6 % of Output + 104 mA	

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	45 Hz to 65 Hz			55 A to 150 A	0.6 % of Output + 130 mA	
	65 Hz to 440 Hz			55 A to 150 A	1.7 % of Output + 130 mA	
	45 Hz to 65 Hz			150 A to 550 A	1.2 % of Output + 520 mA	
	65 Hz to 440 Hz			150 A to 550 A	1.8 % of Output + 520 mA	
	45 Hz to 65 Hz			550 A to 1025 A	1.1 % of Output + 1299 mA	
	Equipment to Measure Capacitance	AEMC BC05	EURAMET cg-15	0.1 nF to 10 μ F	7.86 % of Output	
	Earth Resistance - Measurement	Fluke 1625-2	EURAMET cg-15	0.001 Ω to 2.999 Ω	2.3%+2m Ω	
				3 Ω to 29.99 Ω	2.3%+20 m Ω	
				30 Ω to 299.9 Ω	2.3%+0.2 Ω	
				0.3k Ω to 2.999k Ω	2.3%+2 Ω	
				3k Ω to 29.99k Ω	2.3%+20 Ω	
				30k Ω to 299.9k Ω	2.3%+0.2k Ω	
Electricity	Insulation Resistance - Measurement	Fluke 1550C	EURAMET cg-15	250V	200k Ω to 5G Ω	5.8%
				500V	200k Ω to 10G Ω	5.8%
				1000V	200k Ω to 20G Ω	5.8%

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				2500V	200kΩ to 50GΩ	5.8%
				5000V	200kΩ to 100GΩ	5.8%
					100GΩ to 1TΩ	23%
				OSCILLOSCOPE CALIBRATION		
				Edge Function	Fluke 5080A Oscilloscope Option	OEM Manual, EURAMET cg-7
				Amplitude		
				Frequency		
				Time Marker Function		
				Tachometer (Optical) - Generation	Lutron DT-2269	EURAMET cg-15
				Tachometer		
Temperature	Dry Block Calibration	Isotech Semi SPRT, Fluke 8846A	Euramet Calibration Guide No. 13	-50 °C to 0 °C	0.1 °C	Lab / Site
				0 °C to 100 °C	0.07 °C	
				100 °C to 300 °C	0.1 °C	
				300 °C to 660 °C	0.17 °C	
				660 °C to 1100 °C	1.4 °C	
		Isotech Semi Standard TC-R, Fluke 714B				

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	Infrared Thermometer	CM 500	ASTM E2847	50 °C to 100 °C	0.6 °C	
				100 °C to 300 °C	0.8 °C	
				300 °C to 500 °C	1.0 °C	
	Muffle Furnaces / Ovens / Incubators	SSPRT and TC Sensors	EURAMET cg-20 / EN 60068-3-5	Ambient to 300 °C	0.1 °C	
	Liquid Bath Calibration	SPRT And TC Sensors Via Fluke 8846A	ASTM E2488-9	-25 °C to 150 °C	0.29 °C	
	Temperature Sensors And Temperature Measuring Instruments	FLUKE 9142, 9144, Semi Standard PRT, Fluke 8846A	ASTM-E2877, EA 10/11, OIML R84	-25 °C to 0 °C	0.07 °C	
				0 °C to 150 °C	0.09 °C	
				150 °C to 420 °C	0.18 °C	
				420 °C to 660 °C	0.21 °C	
	Data Logger @ 10 °C To 60 °	Stability Test Chamber ZF120 Thermo-hygrometer-KIMO Measurement	ASTM E126	10% rh to 100% rh	3% of reading	
				-5 to 80 °C	0.1 °C	
Time & Frequency	Equipment to generate Frequency	Universal Counter 5316A	NIST 960-12 Calibration of Stopwatches and Timing Devices	1 Hz to 100 MHz	0.0004 Hz to 10Hz	Lab / Site
	Stop Watch	Universal Counter 5316A Multi Product		10 nS to 50 ns	0.	
				1 μS to 800 μS		
				1mS to 900 mS		
				1S to 60 S		

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		Calibrator		1 min to 60 min		
				1 HH		
Other/ Vibration	Acceleration	Portable Vibration Calibrator 9110D	ISO 16063- 11:1999	(5 to 10)Hz	%5	
	Velocity			10Hz to 10kHz	%3	
	Displacement			(10~1,000)Hz	%3	
Mass	Weighbridge	Deadweight M1	OIMAL-R76	500 – 10000 kg	(25000/500) mg/kg	
	Weight Balance /Scale	Deadweight F1	PRD-0012	0.01 – 50000 g	0.0525 mg – 6.4 mg	
Other/ Chemical	PH Meter	Buffer Solution	As per in Manual &CEC-CAD- PRD-EN-0061	pH 4.01 pH 7.00 pH 10.01	0.025 @ (25C)	Lab / Site
	Conductivity Meter	Conductivity Standards	As per in Manual & CEC-CAD- PRD-EN-0059	1.33 µS/cm – 12903 µS/cm	0.05 µS/cm - 1% µS/cm	
	Turbidity Meter	Formazin Turbidity Standards	As per in Manual	0.5 NTU	0.005 NTU	
				40 NTU	0.08 NTU	
				100 NTU	2 NTU	
				400 NTU	8 NTU	
				1000 NTU	20 NTU	
				4000 NTU	80 NTU	
	Salt content in crude oil	Mixed salt Solution	ASTM D-3230	0 -151 bbt	2.4 %	
	Water content Karl fischer	Water Mark Karl Fischer Water Stander	ASTM D4377, D6869&ASTM D 789	0.1mg/ml	0.005mg/ml	
				1.0 mg/ml	0.05mg/ml	
				10 mg/ml	0.1 mg/ml	
	Min Vapor, R Vapor pressure	Vapor Pressure Standard	ASTM-P-124- 03-VAP	7.41 psi	0.25 psi	
	Sulfur content X- Rey	Sulfur Ref. Standard	OEM	0 -60000 µg/g	2.4 %	

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	Colour Meter	Colour Ref. Standards	As per in Manual	Gardner 2 - Gardner 5	0.1	
Other/ Chemical	Density Meter	Density Ref. Standard	CAD/P-112-1	0.791- 1.12	0.01%	Lab / Site
	Open Cap Flash Point meter	Flash Point Ref. Standard Field Metrology Well 9142	ASTM-D-92 CAD/P-55-1	84 °C	1.12 °C	
	Close Cap Flash Point meter	Flash Point Ref. Standard Field Metrology Well 9142	ASTM-D-93 CAD/P-55-1	64 °C	1.01 °C	
	Freezing Point meter	Freezing Point Ref. Standard Field Metrology Well 9142	ASTM-D-5901-03 CAD/P-55-1	0 – (-31)°C	0.7 °C	
	Smoking Point meter	Smoking Point Ref. Standard	ASTM-D-1322	14.7 – 42.8 mm	0.22mm	
	Pour Point meter	Pour Point Ref. Standard	ASTM-D-97	0 – (-69)°C	1 °C	
	Hydrometer	DAW-ACETONE-TOLUENE	ASTM-368	0.5 – 1	0.1%	
	Shelling (Density of Gas)	Pure Nitrogen	IP-59	1.256 g/L	0.5%	
	Gas-Chromatography	Nitrogen	ASTM-1946	C1 – C6	0.05%	

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	UV- Spectrophotometer	Dry seal	DRY CELL, ASTG4 UV-VIS SPECTRO - IANZ	190-1100 nm	Wavelength : 0.2 nm, Photometric 0.0024 AB.	
	HPLC	Caffine	OME	0 ppm – 100 ppm	0.02 % of Rdg	
	Viscosity & Density Reference Standard	Kinematic and Dynamic	ASTM D445,D446,D2171, CEC-CAD-PRD-EN-0062	0.9 to 7.4 cSt 72 to 180 1000 to 2700 cSt 8000 to 82500 cSt	0.07 % 0.15 % 0.20 % 0.23 %	
Dimensional	Venire Caliper – Micro Meter- Dial Gauge	Gauge Blocks Grade 2	ASME B89.1.14-2018	0.5 mm – 100 mm	0.12 µm – 0.22 µm	Lab / Site
Force	Torque Wrench Torque Driver & Torque Indicator	Torque Wrenches Calibrator /Torque Transducer	Euramet cg-14-v 2.0 &CEC-CAD-PRD-EN-0045	5 to 500 N.m	0.8 % - 0.4 of reading	
				100 t0 1000N.m	0.20 % - 0.16 % of reading	
				200 to 2000N.m	0.40 % - 0.15%of reading	
	compression force load cell	Load cell Straight Point	ASTM E4	(0 - 50000 Kg)	0.1% FS	
Volume	Micro pipette	Analytic Balance	Eruamet Cg-21 V2.1 2021	(100 µl – 220000 µl)	0.3µl-0.6ml	
	Cylinder					
	Conical Flask					
	Liquid Volume / Vertical Cylindrical Tanks	Geometric method using strapping tape (Max Tank diameter: 32m)	ISO 7507-1:2003 (Strapping Method) Or API-MPMS 2.2A&B	50 m ³ 200 m ³ 2,000 m ³ 10,000 m ³	0.17% rdg 0.12% rdg 0.12% rdg 0.11% rdg	Site

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Volume	Liquid Volume / Vertical Cylindrical Tanks	Geometric method using total station (Min Tank diameter: 8m)	ISO 7507-3:2006 ISO 7507-1:2003 API-MPMS 2.2E&D Using the Internal Electro-optical Distance-ranging Method	250 m ³	0.19% rdg	Site
				500 m ³	0.13% rdg	
				2,000 m ³	0.09% rdg	
				20,000 m ³	0.07% rdg	
				75,000 m ³	0.06% rdg	
				120,000 m ³	0.06% rdg	
	Liquid Volume / Vertical Cylindrical Tanks	Geometric method using total station (Min Tank diameter: 5m) or Using the Internal Electro-optical Distance-ranging Method	ISO 7507-4:2010 ISO 7507-1:2003 API-MPMS 2.2A,B,C,&D	200 m ³	0.16% rdg	
				2,000 m ³	0.09% rdg	
				10,000 m ³	0.07% rdg	
				40,000 m ³	0.06% rdg	
				75,000 m ³	0.06% rdg	
				120,000 m ³	0.06% rdg	
	Liquid Volume / Horizontal Cylindrical Tanks	Geometric method using strapping tape (Max Tank diameter: 4m, Max tank length: 30m) or Using the Total Station Reference	ISO 12917-1:2004 API-MPMS 2.2E,F&G	Up to 50 m ³	0.065% FS	