





### **ACCREDITATION CERTIFICATE**

### **LB-CAL-062**

### **Emirates International Accreditation Centre**

has accredited

# EMIRATES METROLOGY INSTITUTE OF ABU DHABI QUALITY AND CONFORMITY COUNCIL

Krypto Labs Building | Masdar City

Abu Dhabi | United Arab Emirates

In accordance with the requirements of

ISO/IEC 17025:2017

General requirements for the competence of testing and calibration laboratories to undertake the calibration in the attached accreditation scope

This Accreditation is invalid without the attached accreditation scope and shall remain in force within the validity period printed below, subject to continuing compliance with the requirements of the accreditation criteria.

Validity: 15-02-2024 to 14-08-2024

Initial Accreditation Date: 15-02-2018





#### LB-CAL-062

### **Emirates Metrology Institute of Abu Dhabi Quality and Conformity Council**

### Krypto Labs Building | Masdar City

### Abu Dhabi | United Arab Emirates

Date: 15-02-2024

	Accreditation History				
Scope	Issue No.	Details	Date		
Time and Frequency, Temperature, Mass, Volume, Density	7	Certificate validity was expanded for 6 months from 15-02-2024 up to 14-08-2024	15-02-2024		
Electrical, Humidity	6				
Time and Frequency	6	Change the Laboratory's location, in addition to: Partially reduction and Modification in CMC values & Range and Specification values	12-12-2022		
Temperature	6	Modification in CMC values & Range and Specification values			
Electrical	5	Modification in CMC Values & Range and Specification values			
Mass	6	Change the Laboratory's location			
Volume	6				
Density	6				
Humidity	5				
Dimension & Force	-	Voluntarily reduction of the full scope			
Time and Frequency	5	Renewal accreditation	31-05-2021		
Mass	5				
Temperature	5				
Dimension	5				
Volume	5				
Density	5				
Humidity	4				
Electrical					
Force					



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### Abu Dhabi | United Arab Emirates

Date: 15-02-2024

	Accreditation History				
Scope	Issue No.	Details	Date		
Time and Frequency	4	Certificate validity (29/09/2019 to 14/02/2021) was	15-02-202		
Mass	4	expanded for 6 months, Transition to ISO/ IEC 17025:2017			
Temperature	4	and to comply with the new accreditation number format			
Dimension	4				
Volume	4				
Density	4				
Humidity	3				
Electrical					
Force					
Time and Frequency	3	Extension in scope	29/03/202		
Mass	3	Modification in CMC Values			
Temperature	3	Extension in scope and Modification in CMC Values			
Dimension	3	Modification in CMC Values			
Volume	3				
Density	3				
Time and Frequency	2	First issuance under the name of EIAC (which was formerly	29/09/201		
Mass and Balance		known as DAC)			
Temperature					
Dimension					
Humidity					
Electrical					
Density					
Volume					
Force					



### **Time and Frequency Calibration**

#### **LB-CAL-062**

### **Emirates Metrology Institute of Abu Dhabi Quality and Conformity Council**

# Krypto Labs Building | Masdar City Abu Dhabi | United Arab Emirates

Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)	Location
General frequency source	CP-E-01	1 MHz to <10 MHz	2.6 x 10 <sup>-11</sup>	Laboratory
		10 MHz to 350 MHz	1.2 x 10 <sup>-11</sup>	
Frequency counter	CP-E-09	1 MHz	1.6 x 10 <sup>-11</sup>	Laboratory
		5 MHz		
		10 MHz		
		1 kHz to 1 MHz	1.7 x 10 <sup>-10</sup>	
		>1 MHz to 100 MHz	3.3 x 10 <sup>-11</sup>	
		>100 MHz to 350 MHz	4.6 x 10 <sup>-11</sup>	
Time Interval – Stopwatches and timers	CP-E-13	20 minutes to 100 hours	0.48 s	Laboratory
Time Interval – Local clock	CP-E-15	24 hours	0.76 s	Laboratory
Time scale difference - Local clock vs. UTC	CP-E-15	± 5 minutes	0.76 s	Laboratory



### **Time and Frequency Calibration**

#### **LB-CAL-062**

### **Emirates Metrology Institute of Abu Dhabi Quality and Conformity Council**

# Krypto Labs Building | Masdar City Abu Dhabi | United Arab Emirates

Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)	Location
Non-contact tachometer	Procedure CP-E-27	30.000 rpm to 99.999	0.0018 rpm	Laboratory
	Calibration of Non	rpm		
	Contact Tachometers	100.00 rpm to 999.99	0.0060 rpm	
		rpm		
		1,000.0 rpm to 9,999.9	0.058 rpm	Laboratory
		rpm		
		10,000 rpm to 99,999	0.58 rpm	
		rpm		
		100,000 rpm to 199,800	5.8 rpm	
		rpm		



#### **Mass Calibration**

#### **LB-CAL-062**

### **Emirates Metrology Institute of Abu Dhabi Quality and Conformity Council**

### **Krypto Labs Building | Masdar City**

### **Abu Dhabi | United Arab Emirates**

Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration  Measurement  Capability  (CMC)	Location	
Mass/ Mass Standards	CP-M-02 "Calibration of Mass Standards" and CP-	500 kg 200 kg	4.9 g 1.9 g	Laboratory	
	M-03 "Weighing Designs"	100 kg	0.25 g	-	
		50 000 g	80 mg		
		20 000 g	10 mg	-	
		10 000 g	1.6 mg	-	
			5 000 g	0.80 mg	-
		2 000 g	0.30 mg		
		1 000 g	0.16 mg		
		500 g	0.080 mg	-	
		200 g	0.030 mg		
		100 g	0.016 mg		
		50 g	0.010 mg		
		20 g	0.0080 mg		
		10 g	0.0060 mg		
		5 g	0.0050 mg		
		2 g	0.0040 mg		
		1 g	0.0030 mg		



#### **Mass Calibration**

# LB-CAL-062 Emirates Metrology Institute of Abu Dhabi Quality and Conformity Council

### Krypto Labs Building | Masdar City

### **Abu Dhabi | United Arab Emirates**

			Calibration	
Calibration Field/	Calibration Method	Range and	Measurement	Location
Measuring Quality	Calibration Method	Specification	Capability	Location
			(CMC)	
Mass/ Mass Standards	CP-M-02 "Calibration of	0.5 g	0.0025 mg	Laboratory
	Mass Standards" and CP-	0.2 g	0.0020 mg	
	M-03 "Weighing Designs"	0.1 g	0.0016 mg	
		0.05 g	0.0012 mg	
		0.02 g	0.0010 mg	
		0.01 g	0.0010 mg	
		0.005 g	0.0010 mg	
		0.002 g	0.0010 mg	
		0.001 g	0.0010 mg	
Mass/ Electronic	CP-M-01 "Calibration of	170 kg	740 mg	Customers
Balances	NAWI's", Weights are available in OIML	100 kg	660 mg	Premises
	Classes:	50 kg	140 mg	
	<ul> <li>E2: 1 mg to 5 kg; max</li> <li>grouped load 11.11 kg.</li> <li>F1: 1 mg to 50 kg; max</li> <li>grouped load 171.1 kg</li> </ul>	20 kg	46 mg	
		10 kg	25 mg	
		5 kg	3.8 mg	
		2 kg	1.5 mg	
		1 kg	0.76 mg	
		500 g	0.38 mg	



#### **Mass Calibration**

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration  Measurement  Capability  (CMC)	Location
Mass/ Electronic	CP-M-01 "Calibration of	200 g	0.15 mg	Customers
Balances	NAWI's", Weights are available in OIML	100 g	0.078 mg	Premises
	Classes:	50 g	0.046 mg	
	• E2: 1 mg to 5 kg; max grouped load 11.11 kg.	20 g	0.038 mg	
	• F1: 1 mg to 50 kg; max	10 g	0.031 mg	
	grouped load 171.1 kg	5 g	0.024 mg	
		2 g	0.018 mg	
		1 g	0.015 mg	
		500 mg	0.012 mg	
		200 mg	0.010 mg	



### **Temperature Calibration**

# LB-CAL-062 Emirates Metrology Institute of Abu Dhabi Quality and Conformity Council

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### **Abu Dhabi | United Arab Emirates**

Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)	Location
Resistance thermometers	Comparison with	-80 °C to 80 °C	0.015 °C	Laboratory
with display unit	platinum resistance thermometer in bath.	>80 °C to 150 °C	0.020 °C	
	EMI procedure: CP-T-01	>150 °C to 250 °C	0.025 °C	
	Comparison with platinum resistance thermometers, utilizing the Zn fixed point. Applies for thermometers longer than 40 cm. EMI procedure: CP-T-01	>250°C to 419.527 °C (Zn fixed point)	0.025 °C	
	Comparison with platinum resistance thermometers, utilizing the Zn and Al fixed points. Applies for thermometers longer than 40 cm. EMI procedure: CP-T-01	>250 °C to 660.323 °C (Al fixed point)	0.025 ℃	



### **Temperature Calibration**

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)	Location
Resistance thermometers with display unit	Comparison with platinum resistance thermometer in a block calibrator.  EMI procedure: CP-T-01	>250 °C to 660 °C	0.15 °C to 0.27 °C	Laboratory
Thermocouples with display unit	Comparison with platinum resistance thermometer in bath EMI procedure: CP-T-01	-80°C to 150°C >150°C to 250°C	0.2°C 0.4°C	Laboratory
	Comparison with platinum resistance thermometer in a block calibrator EMI procedure: CP-T-01	>250 °C to 660 °C	0.4 °C to 0.8 °C	
Temperature Block Calibrators	Comparison with platinum resistance thermometer. EMI procedure: CP-T-03	-30 °C to 660 °C	0.2 °C	Laboratory
Platinum Resistance thermometers	Comparison with platinum resistance thermometers in bath.	-80°C to 80°C >80°C to 150°C	0.01°C 0.015°C	Laboratory
	EMI procedure: CP-T-04	>150°C to 250°C	0.02°C	



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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)	Location
Platinum Resistance thermometers	Comparison with platinum resistance thermometers in a block calibrator. EMI procedure: CP-T-04	>250 °C to 660 °C	0.15 °C to 0.27 °C	Laboratory
	Comparison with platinum resistance thermometers in Zn fixed point. EMI procedure: CP-T-04	419.527°C (Zn fixed point)	0.005°C	
	Comparison with platinum resistance thermometers, utilizing the Zn fixed point. Applies for thermometers longer than 40 cm. EMI procedure: CP-T-04	>250°C to 419.527 °C (Zn fixed point)	0.020 °C	
	Comparison with platinum resistance thermometers in Al fixed point. EMI procedure: CP-T-04	660.323 °C (Al fixed point)	0.020 °C	



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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)	Location
Platinum Resistance thermometers	Comparison with platinum resistance thermometers, utilizing the Zn and Al fixed points. Applies for thermometers longer than 40 cm. EMI procedure: CP-T-04	>250 °C to 660.323 °C (Al fixed point)	0.020 °C	Laboratory
Air Temperature Sensors	Comparison with reference thermometer in an air chamber. EMI procedure: CP-T-01	10 °C to 70 °C	0.10°C to 0.30°C	Laboratory
SPRT Calibration at Fixed points	Triple point of mercury. EMI procedure: CP-T-10	234.3156 K	0.6 mK	Laboratory
	Triple point of water. EMI procedure: CP-T-10	0.01 °C	0.3 mK	
	Ga melting point. EMI procedure: CP-T-10	29.7646 °C	0.6 mK	
	In freezing point. EMI procedure: CP-T-10	156.5985 °C	1.7 mK	
	Sn freezing point. EMI procedure: CP-T-10	231.928 ℃	1.6 mK	



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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration  Measurement  Capability  (CMC)	Location
SPRT Calibration at Fixed	Zn freezing point. EMI procedure: CP-T-10	419.527 °C	1.9 mK	Laboratory
	Al freezing point. EMI procedure: CP-T-10	660.323 °C	16 mK	
SPRT Calibration at Fixed Point Sub-Ranges	Fixed points Hg to H2O EMI procedure: CP-T-10	234.3156 K to 273.16 K	0.7 mK	Laboratory
	Fixed points H2O to Ga EMI procedure: CP-T-10	0.01 °C to 29.746 °C	0.7 mK	
	Fixed points Ga to In EMI procedure: CP-T-10	29.7646 °C to 156.5985 °C	1.8 mK	
	Fixed points In to Sn EMI procedure: CP-T-10	156.5985 °C to 231.928 °C	2.0 mK	
	Fixed points Sn to Zn EMI procedure: CP-T-10	231.928 °C to 419.527 °C	3.0 mK	
	Fixed points Zn to Al EMI procedure: CP-T-10	419.527 °C to 660.323 °C	3 mK to 16 mK	
Calibration of Climatic Chambers	DKD-R 5-7. EMI procedure: CP-T-05	-40 °C to 140 °C	0.2 °C	Customer's Premises
Calibration of Autoclaves	EMI procedure: CP-T-06	110 °C to 140 °C	0.2 °C	Customer's Premises



### **Temperature Calibration**

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration  Measurement  Capability  (CMC)	Location
Base metal thermocouples	Comparison calibration in baths and furnaces.	-70 °C to 250 °C	0.2 °C to 0.4 °C	Laboratory
	EMI procedure: CP-T-07	>250 °C to 1100 °C	0.6 °C to 1.3 °C	
Noble metal thermocouples	Comparison calibration in baths and furnaces.	-50 °C to 250 °C	0.2 °C to 0.4°C	Laboratory
	EMI procedure: CP-T-07	>250 °C to 1100 °C	0.6 °C to 1.0 °C	



### **Humidity Calibration**

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			Calibration	
Calibration Field/	Calibration Method	Range and	Measurement	Location
Measuring Quality	Cambration Method	Specification	Capability	Location
			(CMC)	
Calibration of dew	Calibration in chamber of	10%rh to 95 %rh	0.3%rh to 1.0 %rh	Laboratory
point meters for	humidity generator.	at air temperature from		
relative humidity	EMI procedure: CP-T-02	10°C to 45°C		
		10%rh to 95%rh	0.4%rh to 1.6 %rh	
		at air temperature from		
		45°C to 70°C		
Calibration of	Calibration in chamber of	10%rh to 95%rh	0.4%rh to 1.1 %rh	Laboratory
relative humidity	humidity generator	at air temperature from		
meters for relative	EMI procedure: CP-T-02	10°C to 45°C		
humidity				
		10%rh to 95%rh	0.5%rh to 1.7 %rh	
		at air temperature from		
		45°C to 70°C		
Calibration of Climatic	According to DKD-R 5-7	10 %rh to 90 %rh	0.6 %rh to 2.0 %rh	Customer's
Chambers, Humidity	EMI procedure: CP-T-05	at air temperature from		Premises
Measurements		10°C to 50°C		



#### **Electrical Calibration**

#### **LB-CAL-062**

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration  Measurement  Capability  (CMC)	Location
Solid state DC voltage standards	Procedure CP-E-03	10 V 1.018V	7.3 μV 2.6 μV	Laboratory
DC resistance standards	Procedure CP-E-02  R = measured resistance  value	100 mΩ 1 Ω	0.43X10 <sup>-6</sup> <i>R</i>	-
	value	10 Ω	0.43X10 <sup>-6</sup> R	-
		100 Ω	0.49X10 <sup>-6</sup> <i>R</i>	
		1 kΩ 10 kΩ	0.54X10 <sup>-6</sup> <i>R</i> 0.57X10 <sup>-6</sup> <i>R</i>	
DC resistance Calibration of Resistor	Procedure CP-E-23  R = measured resistance	0.1 Ω/step	0.05 mΩ	
Decades	value	1 Ω/step	50X10 <sup>-6</sup> <i>R</i>	_
		100 Ω/step	7.0X10 <sup>-6</sup> R	
		1 kΩ/step	7.0X10 <sup>-6</sup> <i>R</i>	



#### **Electrical Calibration**

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)	Location
DC resistance	Procedure CP-E-14	0 Ω	3.0 μΩ	Laboratory
Calibration of Instruments	Procedure CP-E-16	1 Ω	3.8 μΩ	
		10 Ω	9.1 μΩ	
		25 Ω	32 μΩ	
		100 Ω	0.10 mΩ	
		200 Ω	0.26 mΩ	
		400 Ω	0.52 mΩ	
DC resistance ratio	Procedure CP-E-12 Bridge	0.1:1 to 10:1	0.08X10 <sup>-6</sup>	
	Procedure CP-E-12	10:01	2.9X10 <sup>-6</sup>	
	Range Extender	100:01	5.8X10 <sup>-6</sup>	
		1000:01	10X10 <sup>-6</sup>	
DC current Calibration of Sources	Procedure CP-E-22  I = measured current	10 μA to 0.3 mA	3.0 nA	
Campiation of Sources	value	>0.3 mA to 100 mA	10X10 <sup>-6</sup> /	
		>100 mA to 1 A	15X10 <sup>-6</sup> /	



#### **Electrical Calibration**

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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration Measurement Capability (CMC)	Location
DC current Calibration of Sources	Procedure CP-E-22  I = measured current  value	>1 A to 10 A >10 A to 150 A	17X10 <sup>-6</sup> /	Laboratory
AC power  Calibration of power  meters	Procedure CP-E-30	1 V to 500 V 0.125 A to 120 A	Active power	
		45 Hz to 65 Hz  Power factor 0 to 1	Reactive power 40 μvar/ VA	
AC energy  Calibration of energy  meters	Procedure CP-E-31	30 V to 490 V 4 mA to 120 A	Active energy 260 μWh/VAh	
		45 Hz to 65 Hz  Power factor 0 to 1	Reactive energy 270 µvarh/VAh	



### **Density Calibration**

# LB-CAL-062 Emirates Metrology Institute of Abu Dhabi Quality and Conformity Council

### **Krypto Labs Building | Masdar City**

### **Abu Dhabi | United Arab Emirates**

			Calibration	
Calibration Field/	Calibration Method	Range and	Measurement	Location
Measuring Quality	Calibration Method	Specification	Capability	Location
			(CMC)	
Solid Density Standard at	CP-V-05 "Solid density	2330 kg/m³	1.5 kg/m <sup>3</sup>	laboratory
20°C	by Hydrostatic weighing"			
Mass: 1 kg	Hydrostatic weighing			
	(comparison to reference			
	silicon sphere SP-1)			
Density of solid at 20°C	CP-V-05 "Solid density	2300 kg/m³ to 2800	1 kg/ m³	
Mass: 20g to 30g	by Hydrostatic weighing"	kg/m³		
	Hydrostatic weighing			
	with use of volume			
	comparator			
Density of solid at 20°C	CP-V-05 "Solid density	1g	60 kg/m³	Laboratory
Mass: 1g to 1kg	by Hydrostatic weighing"	-6	00 kg/ III	
Density: 7900 kg/m3 to	Hydrostatic weighing	2 g	30 kg/m <sup>3</sup>	
8400 kg/m3	with use of volume			
	comparator	5 g	15 kg/m³	
		10 g	8 kg/m³	
		20 g	5 kg/m³	
		50 g	3 kg/m³	



### **Density Calibration**

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			Calibration	
Calibration Field/	Calibration Method	Range and	Measurement	Location
Measuring Quality	Calibration Method	Specification	Capability	Location
			(CMC)	
Density of solid at 20°C	CP-V-05 "Solid density	100 g	2.5 kg/m <sup>3</sup>	Laboratory
Mass: 1g to 1kg	by Hydrostatic weighing"			
Density: 7900 kg/m3 to	Hydrostatic weighing	200 g	2 kg/m³	
8400 kg/m3	with use of volume		_	
	comparator	500 g	2 kg/m³	
		1 kg	1.5 kg/m³	
Density of Liquid at 20°C	CP-V-04	680 kg/m³ to 1200	0.86 kg/m³ to 1.3 kg/m³	Laboratory
	Hydrostatic weighing	kg/m³		
	with use of glass sinker			
	of appr ca. 25g mass			



#### **Volume Calibration**

#### **LB-CAL-062**

### **Emirates Metrology Institute of Abu Dhabi Quality and Conformity Council**

### Krypto Labs Building | Masdar City

### **Abu Dhabi | United Arab Emirates**

Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration  Measurement  Capability  (CMC)	Location
Volume of Liquids	CP-V-01 "Gravimetric	10 μΙ	0.024 μΙ	Laboratory
Piston operated volumetric apparatus	Calibration of piston operated pipetes"	20 µl	0.028 µl	-
(pipettes, dispensers)	Fixed and variable volume single and multi-channel	50 μl	0.046 µl	
	Manual or automatic piston operated pipettes	100 μΙ	0.083 µl	
	using gravimetric method:	200 μΙ	0.17 μΙ	
	- 1 volume (fixed volume pipettes)	500 µl	0.41 μΙ	
	- 3 volumes (variable volume	1000 μΙ	2.1 µl	
	pipettes) -10 readings	2000 µl	5 μΙ	
	As specified in ISO 8655- 6:2002	5000 μl	8 µl	
		10000 μΙ	17 μΙ	
Volume of Liquids Piston	CP-V-01 "Gravimetric	1 ml	0.0021 ml	Laboratory
operated volumetric apparatus	Calibration of piston operated pipettes"	2 ml	0.0050 ml	-
	Fixed and variable volume single and multi-channel	5 ml	0.0080 ml	
	Manual or automatic	10 ml	0.017 ml	



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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration  Measurement  Capability	Location
		_	(CMC)	
Volumetric glassware	CP-V-02 "Gravimetric	10 ml	0.023 ml	Laboratory
One-mark flasks	Calibration of Volumetric Glassware"	20 ml	0.033 ml	
		50 ml	0.047 ml	
		100 ml	0.064 ml	
		200 ml	0.087 ml	
		500 ml	0.13 ml	
		1000 ml	0.19 ml	
Volumetric glassware Graduated measuring	CP-V-02 "Gravimetric Calibration of Volumetric	10 ml	0.070 ml	Laboratory
cylinders	Glassware"	20 ml	0.12 ml	
		50 ml	0.21 ml	
		100 ml	0.38 ml	
		200 ml	0.60 ml	
		500 ml	0.84 ml	
		1000 ml	1.5 ml	
		2000 ml	2.5 ml	



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Calibration Field/ Measuring Quality	Calibration Method	Range and Specification	Calibration  Measurement  Capability  (CMC)	Location
Volumetric glassware Pipettes	CP-V-02 "Gravimetric Calibration of Volumetric	1 ml	0.0060 ml	Laboratory
ripettes	Glassware"	2 ml	0.0060 ml	
		5 ml	0.012 ml	
		10 ml	0.018 ml	-
		25 ml	0.040 ml	
Volumetric glassware Burettes	CP-V-02 "Gravimetric	10 ml	0.020 ml	Laboratory
burettes	Glassware"	25 ml	0.020 ml	-
		50 ml	0.040 ml	-
		100 ml	0.070 ml	1
Metallic prover vessels	CP-V-03 "Gravimetric Calibration of Prover Vessels"	5 L to 100 L	0.10%	Laboratory