



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

QUALITY ASSURANCE OF VIETNAM
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CALIBRATION

Valid To: September 30, 2021

Certificate Number: 3633.02

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations¹:

I. Chemical Quantities

Parameter/Equipment	Range	CMC ² (±)	Comments
Atomic Absorption Spectrophotometer (AAS) – Wavelength Accuracy Absorbance	(190 to 1100) nm (0 to 3) Abs	0.044 nm F: 0.0009 Abs G: 0.0021 Abs H: 0.0006 Abs	A10-37 annex 10 of the OMCL network guideline: Qualification of atomic absorption/atomic emission spectrometers. 1000 ppm single standard solution; 100 ppm mix standard solution; F= flame, G= graphite, H= Hydride
High Performance Liquid Chromatography (HPLC) – Flowrate Wavelength Accuracy	(0.1 to 2.0) mL/min (200 to 770) nm	0.002 mL/min 0.2 nm	A10-24 qualification of high-performance liquid chromatography system gravimetric method standard: Cafein, homium oxide solution; calibrated balance: d <= 0.0001g

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Kjeldahl Distillation Unit – Total Nitrogen	(1 to 200) mg	0.62 %	A10-20: Titration method; standard: NH ₄ ⁺ 1000 pmm, HCl 0.1N
Ultraviolet and Visible Spectrophotometer (UV- Vis) – Wavelength Accuracy Absorbance	(190 to 1100) nm ~0.2 Abs ~0.5 Abs ~1.0 Abs ~1.7 Abs ~2.0 Abs	0.4 nm 0.0039 Abs 0.0048 Abs 0.0063 Abs 0.015 Abs 0.016 Abs	A10-15, ASTM E925 wavelength accuracy: Holmium, didymium filter photometric accuracy with certified reference materials: neutral density glass filter, didymium glass filter, potassium dichromate liquid filter
Elisa Reader – Wavelength Accuracy Absorbance Accuracy	(300 to 700) nm ~ 0 Abs ~ 0.3 Abs ~0.5 Abs ~1.1 Abs ~1.7 Abs ~2.9 Abs	0.3 nm 0.001 Abs 0.005 Abs 0.005 Abs 0.008 Abs 0.010 Abs 0.31 Abs	A10-16 manufacturer's manual Standards: Wavelength accuracy: holmium oxide glass filter Photometric accuracy: neutral density glass filter
Centrifuge, Spin, Systematic Devices Shake – Non-Contact Type	(50 to 20 000) rpm	2.6 rpm	A10-13 manufacturer's manual Standard: digital tachometer

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Dissolution Tester – Time Temperature Rotation Speed Solubility Testing	(0 to 3600) s (20 to 50) °C (30 to 100) rpm (0 to 100) %	0.60 s 0.10 °C 0.59 rpm 5.1 %	A10-17 dissolution. The United States pharmacopeial convention, 2012, p. 5642 - 5649 Standards: certificate prednisone tablets, The United States pharmacopeial convention, 11-2015, CERT1_4-02; temperature datalogger; digital tachometer
Disintegration Tester – Time Temperature Oscillation Frequency	(0 to 900) s (20 to 50) °C (30 to 150) rpm	0.58 s 0.10 °C 0.61 rpm	A10-19 disintegration. The United States pharmacopeial convention 08/2008 Standards: temperature datalogger; digital tachometer

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
pH Meter	(2 to 14) pH	0.022 pH	A10-10 manufacturer's manual; comparison with pH calibration buffer standard solution
Conductivity Meter – Accuracy	Up to 13 mS/cm	1.2 %	A10-11 manufacturer's manual; comparison with conductivity standard solutions
Turbidity Meter – Accuracy	Up to 4000 NTU	2.4 %	A10-12 manufacturer's manual; comparison with turbidity standard solutions
Salinity Meter – Accuracy	~ 5 ppt ~25 ppt ~32 ppt ~45 ppt	1.8 % reading 1.2 % reading 3.3 % reading 1.2 % reading	A10-26 manufacturer's manual; compare with saline standard solutions
Dissolved Oxygen Meter (DO) – Accuracy	(0 to 20) mg/L	0.045 mg/L	A10-22; the winkler titration method. Standards: KIO ₃ , Na ₂ S ₂ O ₃
Total Dissolved Solids Meter (TDS) – Accuracy	Up to 4000 ppm	1.2 %	A10-21; comparison with TDS standard solutions

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Chlorine Meter – Accuracy	(0 to 2.5) mg/l (0 to 4.4) mg/l (0 to 10) mg/l	0.02 mg/l 0.06 mg/l 0.12 mg/l	A10-28; DPD method; manufacturer’s manual; chlorine solution
Biosafety Cabinet – Clean Room			A10-14
HEPA/ULPA Filter Leak Test –			Reference standards:
Particle	Up to 100 %	0.00007 %	NSF/ANSI 49 – 24/06/2016 (biosafety cabinetry: design, construction, performance, and field certification); En 12469 2000
Noise Test	(50 to 100) dB	1.8 dB	
Inflow Velocity	(0.1 to 20) m.s ⁻¹	0.030 m.s ⁻¹	
Downflow Velocity	(0.1 to 20) m.s ⁻¹	0.060 m.s ⁻¹	
Lighting Intensity Test	(50 to 2500) lux	30 lux	
Ultraviolet Lighting Test	(40 to 100) μW/cm ²	14 μW/cm ²	
Performance Test of Filtration System	Up to 100 %	12 %	
BOD Meters	Up to 314 mg/L	10 %	A10-27 manufacturer
Titration Systems –			
Volume of Burette	(0 to 50) mL	0.0005 mL	A10-23 gravimetric method
Acid-Base Electrode	(0 to 14) pH	0.012 pH	A10-23 titration method
Redox Oxidation Electrode	220 mV	5 mV	A10-23 comparison with standard solution
Silver Electrode	(250 to 350) mV	0.04 mV	A10-23 comparison with standard solution

II. Fluid Quantities

Parameter/Equipment	Range	CMC ² (±)	Comments
Laboratory Volumetric Glassware –			A10-02 gravimetric method; balance d =0.01g, d=0.000 01g
Volumetric Flask	(10 to 25) mL (50 to 100) mL (200 to 500) mL 1000 mL 2000 mL	0.019 mL 0.028 mL 0.070 mL 0.15 mL 0.26 mL	
Burette	10 mL 25 mL 50 mL	0.012 mL 0.029 mL 0.058 mL	
Measuring Cylinder	25 mL 50 mL 100 mL 250 mL 500 mL 1000 mL 2000 mL	0.29 mL 0.58 mL 0.58 mL 1.2 mL 2.9 mL 5.8 mL 12 mL	
Volumetric Pipette (Bulb Pipette)	1 mL 2 mL 5 mL 10 mL 20 mL 25 mL 50 mL	0.0006 mL 0.0013 mL 0.0014 mL 0.0022 mL 0.0055 mL 0.0058 mL 0.0081 mL	
Graduated Pipette	1 mL 2 mL (5 to 10) mL 20 mL 25 mL 50 mL	0.006 mL 0.012 mL 0.030 mL 0.058 mL 0.058 mL 0.12 mL	

Parameter/Equipment	Range	CMC ² (±)	Comments
Piston Operated Volumetric Apparatus –			A10-018 gravimetric method; balance d =0.01g, d=0.00001g
Pipette	10 µL 20 µL 50 µL 100 µL 500 µL 1000 µL 2500 µL 5000 µL 10 000 µL 20 000 µL	0.05 µL 0.08 µL 0.08 µL 0.08 µL 0.10 µL 0.13 µL 3.0 µL 3.0 µL 5.9 µL 12 µL	
Burette	(1 to 50) mL	0.008 mL	
Dispensers	10 mL 25 mL 50 mL	0.12 mL 0.29 mL 0.58 mL	

III. Mechanical

Parameter/Equipment	Range	CMC ² (±)	Comments
Electronic Balance	(0 to 0.1) g (0.1 to 5) g (5 to 22) g (22 to 120) g (120 to 200) g (200 to 320) g (320 to 410) g (410 to 2000) g (2000 to 6200) g (6200 to 15 000) g	0.000 006 g 0.000 017 g 0.000 04 g 0.000 09 g 0.0002 g 0.0003 g 0.0010 g 0.010 g 0.012 g 2.9 g	A10-01 comparison indicator of balance with standard weight; Weights class: E2, F1, M1
Pressure of Autoclave	Up to 5 bar	0.022 bar	A10-43 comparison with pressure datalogger; standard: datalogger – technosoft

IV. Thermodynamic

Parameter/Equipment	Range	CMC ² (±)	Comments
Temperature Chamber (Oven, Incubator, Refrigerator, Freezer)	(-80 to -20) °C (-20 to 4) °C (4 to 70) °C (70 to 105) °C (105 to 150) °C (150 to 180) °C	2.0 °C 1.1 °C 0.34 °C 0.46 °C 0.61 °C 1.0 °C	A10-03 thermocouple type K, T with datalogger
Furnace	(350 to 950) °C	1.7 °C	A10-04 thermocouple type K with datalogger
Reactor Block	105 °C 150 °C 350 °C 450 °C	1.2 °C 1.2 °C 1.8 °C 2.6 °C	A10-07 thermocouple type K with datalogger
Temperature of Autoclave	(50 to 140) °C	0.37 °C	A10-05 temperature datalogger
Liquid Baths	(0 to 100) °C	0.26 °C	A10-06 temperature datalogger, thermocouple type K with datalogger
Glass Liquid Thermometer	(-20 to 100) °C	0.13 °C	A10-08 comparison with standard thermometer; Standard temperature control bath – poliscience
Digital & Analog Temperature Sensor, Probe Thermometer	(-20 to 150) °C (150 to 400) °C (400 to 650) °C	0.07 °C 0.25 °C 0.45 °C	A10-09 comparison with standards thermometer; standard temperature control bath – poliscience; field metrology well – Fluke

Parameter/Equipment	Range	CMC ² (±)	Comments
Thermo-Hygrometer –			
Temperature	(15 to 50) °C	0.35 °C	A10-25 comparison with standard thermo-hygrometer
Humidity	(30 to 90) % RH	1.4 % RH	

¹ This laboratory offers commercial calibration service and field calibration service.

² Calibration and Measurement Capability Uncertainty (CMC) is the smallest uncertainty of measurement 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. CMCs represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

³ Field calibration service is available for this calibration and this laboratory meets A2LA R104 – *General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* for these calibrations. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the actual uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.

⁴ In statement of CMC, percentages are percentage of reading, unless otherwise indicated.



Accredited Laboratory

A2LA has accredited

QUALITY ASSURANCE OF VIETNAM

Hanoi, VIETNAM

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets R205 – Specific Requirements: Calibration Laboratory Accreditation Program. 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).



Presented this 23rd day of September 2019.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3633.02
Valid to September 30, 2021

For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.