SERVICIO ECUATORIANO DE NORMALIZACIÓN

Development of Basic Metrolog Infrastructure to Support Medical Equipment Testing (Ventilators as a Americas.

Activity N°3 Micro volume measurements







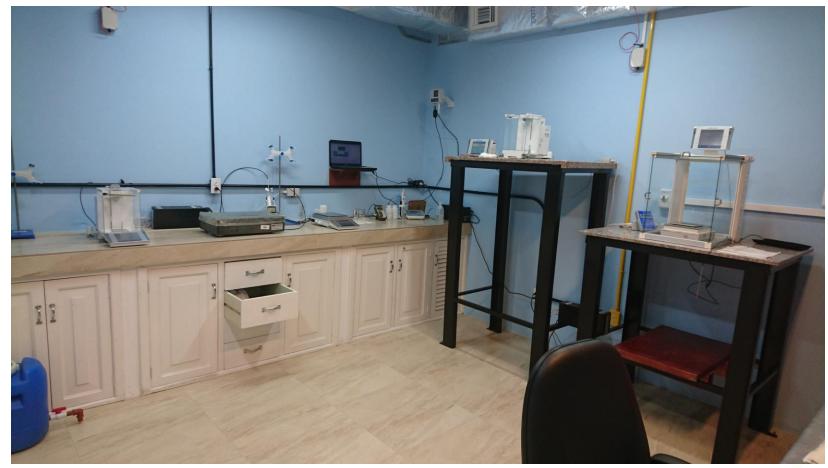
Laboratorio Nacional de Metrología – INEN Volume







Currently, the volume laboratory has the following infrastructure, staff and equipment:



• Infrastructure

17 m² approx.

Staff
Wilson Gallegos
Víctor Guevara







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Scales

- XP 205; resolution 0,000 01 g
- XP 8002; resolution 0,01 g

Fuente: ISO 8655-6	Resolution	Repeatability	Typical Uncertainty
Volume	mg	mg	mg
[1;10] µL	0,001	0,002	0,002
]10;100] µL	0,01	0,02	0,02
]100;1 000] µL	0,1	0,2	0,2
]1;10] mL	0,1	0,2	0,2
]10;200] mL	1	2	2

Calibration Process

- Piston Pipettes, volumes greater than "20 μL"
- Instruments for measure volume until 5 L







Scales

- XP 504; resolution 0,000 1 g
- XP 10003; resolution 0,001 g

Calibration Process

 Instruments for measure volume from 100 mL to 5 L





Metrological Traceability Mass Laboratory – LNM *NIST*







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Calibration of Piston Pipettes Gravimetric Method from "20 µL"

Scale resolution 0,000 01 g

20 µL until 10 mL







Metrological Traceability NIST National Standard of Mass (1 kg) – LNM





Proposal

Increase the range of Volume Laboratory measurements - LNM

Why does born?

- Customer requirement
 - External; control institutions (Agro, Health)
 - Internal; "Analytical Testing", Chemical Metrology
- Experiences on calibration processes
 - "Observations" on the results and uncertainty
 - "Low uncertainties"
 - Tips
 - New, used, "clean"
- Current situation, COVID-19 Pandemic



Proposal

Increase the range of Volume Laboratory measurements - LNM

The expected

- Improve the calibration process of piston pipettes (piston type), through gravimetry, from 20 μL
- "Expand" the measurement ranges from "1 μL a 20 μL "
- Mark the start of the process to achieve the CMC's declaration

Needs

- Audits real situation (INM's)
- INM's advice with development and knowledge in the measurement of micro volumes
- Measure volumes from "1 µL"
 - Pipettes donated in the Project
 - Mass Laboratory Support LNM



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