

Development of Basic Metrology Infrastructure to Support Medical Equipment Testing (Ventilators as a Priority) in The Americas.

Activity N°3

Micro volume measurements



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Laboratorio Nacional de Metrología – INEN Volume



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Current situation

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



- Infrastructure

17 m² approx..

- Staff

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Current situation

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] μ L	0,001	0,002	0,002
]10;100] μL	0,01	0,02	0,02
]100;1 000] μ L	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 μ L”***
- *Instruments for measure volume until 5 L*

Equipment



Current situation

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*



Current situation

Metrological Traceability

Mass Laboratory – LNM

NIST



Current situation

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



Thanks you!



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