

CALIBRATION CERTIFICATE INFORMATION

Instituto Nacional De Metrologia - Colombia
Avenida Carrera 50 No. 26 - 55 Interior 2

Certificate number: 4637

Object to calibrate: Non Automatic Weighing Instrument (NAWI)

Identification: Balanza Mettler Toledo XPE 205
Serial: B743848411 / AF-07090
Calibration date: 2020-07-16
Calibration place: Bogotá - Colombia. Avenida Carrera 50 No. 26 - 55 Interior 2
Responsible person: Ingeniero Jhon Alexander Barreto Gutiérrez
Físico Jorge Daniel Garcia Benavides

Environmental conditions during calibration

Ambient temperature: 19.85 °C
Barometric pressure: 751.75 hPa
Relative humidity: 46.05 %

NAWI description

Maximum load: 220 mg
Minimum load: 0.01 mg
Readability: 0.01 mg

masscor App Version: 0.1.12

<http://186.155.29.169:3838/masscor/>

Repeatability test results

Table 1: Repeatability test data. Units: [g]

	Load No. 1 / g	Load No. 2 / g	Load No. 3 / g
Ind.1	0.00999	99.99997	199.99995
Ind.2	0.00999	100.00001	200.00000
Ind.3	0.00999	99.99998	199.99998
Ind.4	0.01000	99.99998	199.99999
Ind.5	0.01001	99.99997	199.99996
Ind.6	0.01000	99.99998	199.99996
Ind.7	0.01001	99.99997	199.99996
Ind.8	0.01001	99.99996	199.99997
Ind.9	0.01000	99.99999	199.99995
Ind.10	0.01001	99.99996	199.99996
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Load	0.01	100.00	200.00
Standard.deviation	8.8e-06	1.5e-05	1.7e-05

Excentricity test results

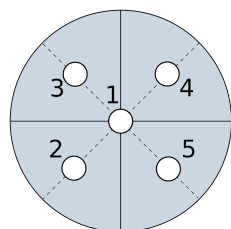
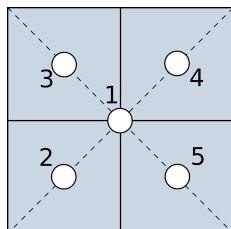


Table 2: Eccentricity test results

Position	Indication / g	Difference / g
1 (Central position)	99.99997	-
2	99.99996	-0.00001
3	100.00003	0.00006
4	99.99998	0.00001
5	99.99994	-0.00003
Maximum difference		0.00006

Indication error test

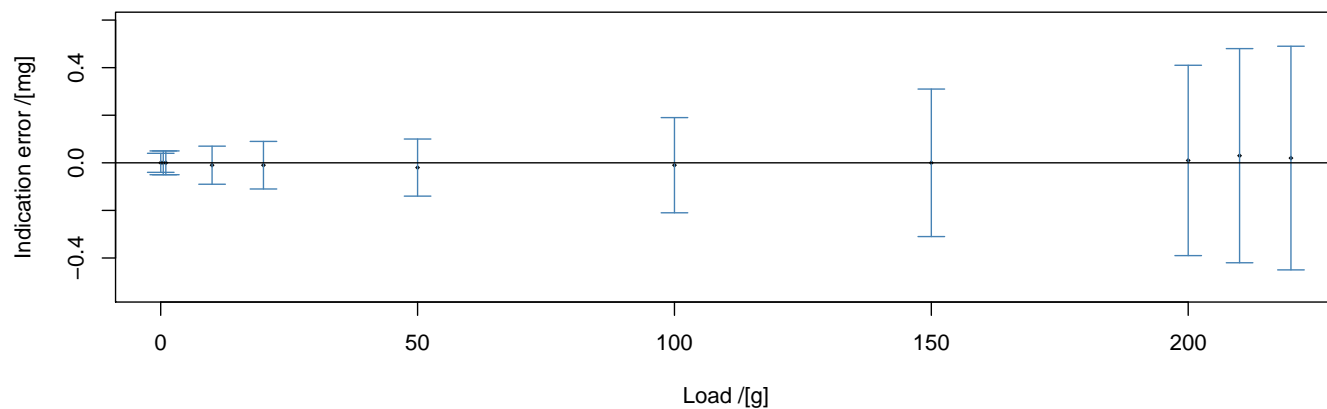


Figure 1: Indication error plot for the NAWI.

Table 3: Indication error test results

Load / g	Error / mg	Uncertainty / mg
0.01	0.00	0.04
0.5	0.00	0.05
1	0.00	0.05
10	-0.01	0.08
20	-0.01	0.10
50	-0.02	0.12
100	-0.01	0.20
150	0.00	0.31
200	0.01	0.40
210	0.03	0.45
220	0.02	0.47

Uncertainties are expanded, with a coverage factor of 2.

Comments section

This calibration certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI). The results of this certificate are related to the calibrated object.

For the calibration is used the method of direct comparison with standard weights, in accordance with the document “Guidelines on the Calibration of Non-Automatic Weighing Instruments” EURAMET Calibration Guide No 18 version 4.0 (11/2015). The following tests applies: eccentricity, it determines the difference of indication of the instrument with load in peripheral positions, as opposed to the position in center of the load receptor. Repeatability, to quantify the difference between the results of several weighing ones of the same load when it is deposited several times and of practically identical form on the load receptor and error of indication, considers the performance of the instrument in the total range of measurement

Review in a periodic way the behavior of the balance by means of control with calibrated weights. If the balance is moved to another location after the calibration are likely to alter performance of the balance and may invalidate the calibration. The conformity of the equipment is responsibility of the user according to the use and tolerances established in the processes. Internal adjustment was made to the balance.