

ISO/IEC 17025 Calibration Certificate



201 Wolf Drive • P.O. Box 87 • Thorofare, NJ 08086-0087 • Phone: 856-686-1600 • Fax: 856-686-1601 • www.troemner.com • e-mail: troemner@troemner.com

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Weight

SECTION 1: NAME AND ADDRESS OF CUSTOMER

Certificate Number 955483-1
Date of Calibration 13-JUL-2017
Calibration Due Date 13-JUL-2019

End user
A-1 Scale Co.
3287 Sherman Way
Slinger WI 53086

Client
A-1 Scale Co
3287 Sherman Way
Slinger WI 53086

SECTION 2: APPROVED SIGNATORY


Joseph Moran, Metrology Manager

SECTION 3: PERSON PERFORMING WORK

Robotic Calibration

SECTION 4: CERTIFICATE INFORMATION

Description of Masses: Analytical Weight Set

Accuracy Class : ASTM E617-13 Class 1
Order Number : SLK 7717
Construction : Two Piece
Material : Stainless Steel
Serial Number : 37619

Date Received : 07-JUL-2017
Date of Calibration : 13-JUL-2017
Date of Issue : 14-JUL-2017
Weight Range : 500g-2kg

SECTION 5: ENVIRONMENTAL CONDITIONS DURING TEST

Temperature: 21.88 °C

Pressure: 759.82 mm Hg

Relative Humidity: 52%

SECTION 6: PERTINENT INFORMATION

The Weights listed on this calibration report have been compared to reference mass standards that are traceable to the SI through the National Institute of Standards and Technology under Test No. 684/289871-17.

Reference standards and balances used to perform the calibration are listed in Section 10.

The weights calibrated for this report have been calibrated in accordance with Troemner's calibration process. The calibration performed meets Echelon I criteria as described in the NIST/NVLAP Technical Guide 150-2.

This calibration also meets specifications as outlined in ISO 9001, ISO/IEC 17025, ANSI/NCSL Z540-1-1994, and applicable documents.

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SECTION 7: TRUE MASS (MASS IN VACUUM) CALIBRATION DATA

Nominal Mass Value	Notes	Serial Number	----- As Found	True Mass	----- As Left	Density ¹ of Weight	Uncertainty (+ or -)
2 kg				2000.0030 g	2000.0030 g	7.9500 g/cm ³	1.0 mg
1 kg	F			1000.00166 g	1000.00086 g	8.0300 g/cm ³	0.50 mg
500 g	F			500.00075 g	500.00042 g	8.0300 g/cm ³	0.25 mg

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SECTION 8: CONVENTIONAL MASS CALIBRATION VALUE VS. REFERENCE DENSITY 8000 kg/m³

Nominal Mass Value	Notes	Serial Number	---- Conventional Mass Value ----		Uncertainty (+ or -)	Tolerance (+ or -)
			As Found	As Left		
2 kg			2000.0011 g	2000.0011 g	1.0 mg	5.0000 mg
1 kg	F		1000.00222 g	1000.00142 g	0.50 mg	2.5000 mg
500 g	F		500.00103 g	500.00070 g	0.25 mg	1.2000 mg

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SECTION 9: CONVENTIONAL MASS CALIBRATION DATA VS. REFERENCE DENSITY 8000 kg/m³

Nominal Mass Value	Notes	Serial Number	-- Conventional Mass Correction --		Uncertainty (+ or -)	Tolerance (+ or -)
			As Found	As Left		
2 kg			1.1 mg	1.1 mg	1.0 mg	5.0000 mg
1 kg	F		2.22 mg	1.42 mg	0.50 mg	2.5000 mg
500 g	F		1.03 mg	0.70 mg	0.25 mg	1.2000 mg

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SECTION 10: CALIBRATION PROCEDURE DATA

Nominal Mass Value	Serial Number	Standard Set No.	Cal Due	Balance Used	Cal Due	Procedure Used
2 kg		S1106	07/01/18	CC10000S-102A	06/01/18	Multi A-B
1 kg		S124	07/01/18	A1000XXL-135	01/01/18	Multi A-B
500 g		S124	07/01/18	A1000XXL-135	01/01/18	Multi A-B

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SECTION 11: GENERAL INFORMATION

This calibration was performed in Troemner's High Precision Level I Mass Metrology Laboratory at 201 Wolf Drive, Thorofare, New Jersey 08086 unless otherwise noted on the Addendum. The internal procedures used are CAL-CLASSI and NIST HB145.

SECTION 12: DEFINITIONS AND TERMS

TRUE MASS - The mass of a weight as if it were measured in a vacuum. Also known as Mass in a Vacuum.

CONVENTIONAL MASS - The conventional value of the result of weighing in air in accordance to International Recommendation OIML D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of a density of 8000 kg/m³ which it balances in air of a density of 1.2 kg/m³.

AS FOUND TRUE MASS - The measured value of the mass(es) as they were received by Troemner.

AS LEFT TRUE MASS - The measured value of the mass(es) after adjustment, repair, or replacement when necessary. The As Found True Mass will equal the As Left True Mass if the mass(es) did not require adjustment, repair or replacement.

NOMINAL MASS - The mass value as marked on the weight.

CORRECTION - The difference between the conventional mass value of a weight and its nominal value. A positive correction indicates that the conventional mass value is greater than the nominal value by the amount of the correction.

AS FOUND CONVENTIONAL MASS CORRECTION - The conventional correction of the result, as it was received by Troemner, of weighing in air in accordance to International Recommendation D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of density 8000 kg/m³ which it balances in air density of 1.2 kg/m³. If the customer requires cleaning prior to calibration, the after cleaning correction would be reported.

AS LEFT CONVENTIONAL MASS CORRECTION - The conventional correction of the result, after adjustment, repair, or replacement of weighing in air in accordance to International Recommendation D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of density 8000 kg/m³ which it balances in air density of 1.2 kg/m³. The As Found will equal the As Left Conventional Mass Correction if the mass(es) did not require adjustment, repair or replacement.

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SECTION 12: DEFINITIONS AND TERMS (continued)

UNCERTAINTY - Non-negative parameter characterizing the dispersion of the quantity values being attributed to a measurand, based on the information used. The uncertainty is calculated in accordance with NIST TechNote 1297 / UKAS M3003 using a coverage factor of $k = 2$ ($k = 2$ defines an interval having a level of confidence of approximately 95 percent). The uncertainty does not include possible effects of magnetism.

TOLERANCE - Defines the limits in which the correction value and the uncertainty must fall to meet the tolerance specification for the given Class.

AS FOUND CONVENTIONAL MASS VALUE - The measured value of the mass(es) as they were received by Troemner, of weighing in air in accordance to International Recommendation OIML D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of density 8000 kg/m³ which it balances in air density of 1.2 kg/m³. If the customer requires cleaning prior to calibration, the after cleaning value would be reported.

AS LEFT CONVENTIONAL MASS VALUE - The measured value of the mass(es) after they were adjusted, repaired or replaced when necessary, of weighing in air in accordance to International Recommendation OIML D 28. For a weight taken at 20 °C, the Conventional Mass is the mass of a reference weight of density 8000 kg/m³ which it balances in air density of 1.2 kg/m³. The As Found will equal the As Left Conventional Mass Value if the mass(es) did not require adjustment, repair or replacement.

ASTM E617 - Weights meet the tolerance specification for ASTM E617. Weights 2kg - 1g screened for magnetism using a Gaussmeter.

SECTION 13: ADDENDUM

500g and 1kg found out of tolerance, weights wiped, adjusted and recalibrated.