



Steve Troxler
Commissioner

North Carolina Department of Agriculture
and Consumer Services
Standards Division
Standards Laboratory

Stephen Benjamin
Director

NC Standards Laboratory Calibration Certificate

Submitted by: Porter Scales 1721 Lake Wheeler Rd. Raleigh, NC 27603	Date of Test: 4/24/2017 Test Number: NC1704-157-W P.O. Number: 17148 Page Number: 1 of 4
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General Description: One set of 16 weights Set Serial Number: KG 005 Manufacturer: Rice Lake Material: Stainless Steel

Item(s) Tested and Approved:						
# of Items	Nominal	Description	Tolerance	Measurement Uncertainty	<i>k</i> Coverage Factor	Serial Number(s) (Listed alphabetically)
1	5 kg	Weight	NIST Class F	60 mg	2.02	none
2	2 kg	Weights	NIST Class F	24 mg	2.02	plain, single dot
1	1 kg	Weight	NIST Class F	13 mg	2.02	none
1	500 g	Weight	NIST Class F	9.2 mg	2.02	none
2	200 g	Weights	NIST Class F	4.7 mg	2.01	plain, single dot
1	100 g	Weight	NIST Class F	2.4 mg	2.01	none
1	50 g	Weight	NIST Class F	1.2 mg	2.01	none
2	20 g	Weights	NIST Class F	0.48 mg	2.01	plain, single dot
1	10 g	Weight	NIST Class F	0.25 mg	2.01	none

NVLAP Lab Code 200495-0

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Form No.: NCM03 Revision Date: 1/5/17
Filename: H:\Standlab\FILESYS\WB_PORTE2017\NC1704-157-W.docx

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Item(s) Tested and Approved:						
# of Items	Nominal	Description	Tolerance	Measurement Uncertainty	<i>k</i> Coverage Factor	Serial Number(s) (Listed alphabetically)
1	5 g	Weight	NIST Class F	0.19 mg	2.01	none
2	2 g	Weights	NIST Class F	0.13 mg	2.03	plain, single dot
1	1 g	Weight	NIST Class F	0.11 mg	2.03	none

Tolerance: At the time of test, the above weights fall within the tolerance listed. Compliance to design specifications only applies to the tolerance class listed above.

Traceability: This certificate has been issued under the authority of the North Carolina Department of Agriculture & Consumer Services, Standards Division, pursuant to Chapters 81A and 119 of the General Statutes of the State of North Carolina. The items described above have been compared with the standards of the State of North Carolina, and are traceable to the National Institute of Standards and Technology, NIST via the test number above, and to the SI via NIST. All tests were performed at the North Carolina Standards Laboratory, 4040 District Drive, Raleigh, North Carolina 27607. Environmental conditions are maintained at a temperature of 18 °C to 27 °C and a relative humidity of 50 % ± 10 %.

Test Data: Actual test results for this calibration are reported on the attached NCDA&CS Standards Laboratory Test Data Sheet Supplement for NC Test Number NC1704-157-W. The complete report must include both this certificate and the data sheet supplement. The reported test results apply only to the items listed above.

Uncertainty Statement: The measurement uncertainty is calculated according to JCGM 100:2008, GUM 1995 with minor corrections, First edition, September 2008, "Evaluation of measurement data – Guide to the expression of uncertainty in measurement." The uncertainty reported is *k* (refer to the table above for *k* value) times the root sum square of the type A and B uncertainties, which represents a confidence level of 95.45 %. Uncertainty components evaluated include balance standard deviations, mass standard uncertainties, drift uncertainties, sensitivity uncertainties, bias, and absence of air buoyancy corrections.

Magnetism: These weights have not been tested for magnetic properties. Since the effects are difficult to quantify, no magnetism components are included in the uncertainty budget. Weights are screened for magnetism only if erratic balance behavior is observed during calibration. If a significant magnetic field is found, the weight is rejected.

Condition of Item(s) Upon Receipt:

Good	Artifacts display some wear or other degradation.
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Test Method Used:

NC SOP 8, *Medium Accuracy Calibration of Mass Standards by Modified Substitution (August 2016 Ed)*, based on NISTIR 6969, *Selected Laboratory and Measurement Practices and Procedures to Support Basic Mass Calibrations (2014 Ed)* - SOP No. 8, *Medium Accuracy Calibration of Mass Standards by Modified Substitution (June 2015 Ed)*.

*Any deviations from or additions to the SOP have been reviewed and approved for use by laboratory management. These deviations are documented and filed in the laboratory files.

Standards Used:

Standards are continuously monitored by a measurement control program. Artifacts are recalibrated if drift, damage, wear or other detrimental condition is noted. Balances are used for comparisons only. No calibration is required.

Working Standard	Working Standard Set Serial Number	Working Standard Test Number	Working Standard Calibration Date	Balance Used
5 kg ws	NCDA 261	NC1612-060-WD	12-12-2016	CCE5003
2 kg ws	NCDA 259	NC1702-183-WD	3-2-2017	CCE5003
1 kg ws	NCDA 275	NC1612-078-WD	12-19-2016	CCE5003
500 g ws	NCDA 275	NC1612-078-WD	12-19-2016	CCE5003
200 g (pl) ws	NCDA 275	NC1612-078-WD	12-19-2016	AX205
100 g ws	NCDA 275	NC1612-078-WD	12-19-2016	AX205
50 g ws	NCDA 275	NC1612-078-WD	12-19-2016	AX205
20 g (pl) ws	NCDA 275	NC1612-078-WD	12-19-2016	AX205
10 g ws	NCDA 275	NC1612-078-WD	12-19-2016	AX205
5 g ws	NCDA 275	NC1612-078-WD	12-19-2016	AX205
2 g (pl) ws	NCDA 275	NC1612-078-WD	12-19-2016	UMT5/6
1 g ws	NCDA 275	NC1612-078-WD	12-19-2016	UMT5/6



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Next Appointment Scheduled for:

4/25/2018

We would appreciate feedback on your recent experience with our laboratory. Please complete our short online survey at www.ncagr.com/standard/survey.


Metrologist

4/24/2017
Date


Approved By



Laboratory Manager: Sharon Woodard Quality Manager: Robert Rogers
Metrologists: Van Hyder, Ashley Lessard, Sherry Teachey, Nicholas Cercone

Original Certificate has the NCDA Seal Embossed Above


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Form No.: NCM03 Revision Date: 1/5/17
Filename: H:\Standlab\FILESYS\WB_PORTE\2017\NC1704-157-W.docx

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NCD&CS Standards Laboratory Test Data Sheet Supplement for the Test Number Listed Below



Company Name: Porter Scales
 Address: 1721 Lake Wheeler Rd.
 City, State, Zip: Raleigh, NC 27603
 General Description: One set of 16 weights
 Representative: Tommy Albright
 Set Serial Number: KG 005
 Material: Stainless Steel
 Condition of Weights: Good

NC Test No: NC1704-157-W
 Purchase Order No: 17148
 Date Scheduled: April 21, 2017
 Date Received: April 24, 2017
 Date Tested: April 24, 2017
 Date Returned: April 24, 2017
 Next Appointment: April 25, 2018

Environmental Conditions at Time of Test		
	Beginning	Ending
Temperature (°C)	20.7	20.6
Relative Humidity (%)	55	60
Barometric Pressure (mmHg)	746.7	746.7

Line No	Weight Information		Tolerance Information		Balance Readings				Approximate Error				Uncertainty	Working Standard	Wk Std Cal Date	Balance Used	Standard Correction
	Serial Number	Nominal Mass	Tolerance Class	Full Tolerance	Before Adjustment	After Adjustment	As Found	In Tol?	As Left	In Tolerance?							
1	none	5 kg	NIST Class F	0.5 g	0.141 g	---	g	140 mg	Appd	140 mg	Approved	60 mg	5 kg ws	12-12-2016	CCE5003	-1.10185 mg	
2	plain	2 kg	NIST Class F	0.2 g	0.095 g	---	g	80 mg	Appd	80 mg	Approved	24 mg	2 kg ws	3-2-2017	CCE5003	-14.7471 mg	
3	single dot	2 kg	NIST Class F	0.2 g	0.099 g	---	g	84 mg	Appd	84 mg	Approved	24 mg	2 kg ws	3-2-2017	CCE5003	-14.7471 mg	
4	none	1 kg	NIST Class F	0.1 g	0.013 g	---	g	13 mg	Appd	13 mg	Approved	13 mg	1 kg ws	12-19-2016	CCE5003	0.37544 mg	
5	none	500 g	NIST Class F	0.07 g	0.025 g	---	g	25.2 mg	Appd	25.2 mg	Approved	9.2 mg	500 g ws	12-19-2016	CCE5003	0.19215 mg	
6	plain	200 g	NIST Class F	0.04 g	0.01846 g	---	g	18.5 mg	Appd	18.5 mg	Approved	4.7 mg	200 g (pl) ws	12-19-2016	AX205	0.02165 mg	
7	single dot	200 g	NIST Class F	0.04 g	0.01881 g	---	g	18.8 mg	Appd	18.8 mg	Approved	4.7 mg	200 g (pl) ws	12-19-2016	AX205	0.02165 mg	
8	none	100 g	NIST Class F	0.02 g	0.00580 g	---	g	5.8 mg	Appd	5.8 mg	Approved	2.4 mg	100 g ws	12-19-2016	AX205	0.03258 mg	
9	none	50 g	NIST Class F	0.01 g	0.00062 g	---	g	0.6 mg	Appd	0.6 mg	Approved	1.2 mg	50 g ws	12-19-2016	AX205	0.02225 mg	
10	plain	20 g	NIST Class F	0.004 g	0.00091 g	---	g	0.88 mg	Appd	0.88 mg	Approved	0.48 mg	20 g (pl) ws	12-19-2016	AX205	-0.03071 mg	
11	single dot	20 g	NIST Class F	0.004 g	0.00115 g	---	g	1.12 mg	Appd	1.12 mg	Approved	0.48 mg	20 g (pl) ws	12-19-2016	AX205	-0.03071 mg	
12	none	10 g	NIST Class F	0.002 g	0.00095 g	---	g	0.97 mg	Appd	0.97 mg	Approved	0.25 mg	10 g ws	12-19-2016	AX205	0.01596 mg	
13	none	5 g	NIST Class F	0.0015 g	0.00052 g	---	g	0.50 mg	Appd	0.50 mg	Approved	0.19 mg	5 g ws	12-19-2016	AX205	-0.01931 mg	
14	plain	2 g	NIST Class F	1.1 mg	0.5661 mg	---	mg	0.55 mg	Appd	0.55 mg	Approved	0.13 mg	2 g (pl) ws	12-19-2016	UMT5/6	-0.01147 mg	
15	single dot	2 g	NIST Class F	1.1 mg	0.6591 mg	---	mg	0.65 mg	Appd	0.65 mg	Approved	0.13 mg	2 g (pl) ws	12-19-2016	UMT5/6	-0.01147 mg	
16	none	1 g	NIST Class F	0.9 mg	0.4964 mg	---	mg	0.48 mg	Appd	0.48 mg	Approved	0.11 mg	1 g ws	12-19-2016	UMT5/6	-0.0139 mg	
17					?	---	---	---	mg	?	---	---	---	---	---	---	---
18					?	---	---	---	mg	?	---	---	---	---	---	---	---

The "As Found" value for the weight reflects the condition of the weights as they were delivered for test. This condition does not necessarily represent the "As Used" condition of the weights if they have been cleaned, painted, or damaged in shipment.

These weights have not been tested for magnetic properties. Since the effects are difficult to quantify, no magnetism components are included in the uncertainty budget. Weights are screened for magnetism only if erratic balance behavior is observed during calibration. If a significant magnetic field is found, the weight is rejected.

This data sheet has been issued under the authority of the North Carolina Department of Agriculture & Consumer Services, Standards Division, pursuant to Chapters 81A and 119 of the General Statutes of the State of North Carolina.

Date	Metrologist	Work Completed	Date	Metrologist	Work Completed
4/24/2017	ael	Received, tested, and returned weights			

Weights Approved 16
Weights Adjusted 0
Weights Rejected 0

METROLOGIST: *Ashley* Date: 4/24/2017 RECEIVED BY: *Emilia A. Kuzner* Date: 4-25-17 RETURNED BY: _____