



Steve Troxler
Commissioner

North Carolina Department of Agriculture
and Consumer Services

Stephen Benjamin
Director

Standards Division
Standards Laboratory

NC Standards Laboratory Calibration Certificate

Submitted by: Porter Scales 1721 Lake Wheeler Rd. Raleigh, NC 27603	Date of Test: 4/24/2017
	Test Number: NC1704-168-W
	P.O. Number: 17148
	Page Number: 1 of 4

General Description: One set of 21 weights
Set Serial Number: KG 003
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)
2	5 kg	Weights	NIST Class F	60 mg	2.02	plain, single dot
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
5	500 g	Weights	NIST Class F	9.2 mg	2.02	A, B, C, D, E
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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Item(s) Tested and Approved:						
# of Items	Nominal	Description	Tolerance	Measurement Uncertainty	k 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 NC1704-168-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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NC Standards Laboratory Calibration Certificate

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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



NVLAP Lab Code 200495-0

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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.

Nicholas Cercone
Metrologist

4/24/17
Date

[Signature]
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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NVLAP Lab Code 200495-0

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



NVLAP Lab Code 200495-0

Company Name: Porter Scales
 Address: 1721 Lake Wheeler Rd.
 City, State, Zip: Raleigh, NC 27603
 General Description: One set of 21 weights
 Representative: Tommy Albright
 Set Serial Number: KG 003
 Material: Stainless Steel
 Condition of Weights: Good

NC Test No: NC1704-168-W
 Purchase Order No: 17148
 Date Scheduled: April 21, 2017
 Date Received: April 24, 2017
 Date Tested: April 24, 2017
 Date Returned: April 25, 2017
 Next Appointment: April 25, 2018

Manufacturer: Rice Lake
 Phone: (919) 828-1750
 Return Via: p/u
 Ship Charges: \$0.00

Environmental Conditions at Time of Test		
	Beginning	Ending
Temperature (°C)	20.9	21.2
Relative Humidity (%)	55	57
Barometric Pressure (mmHg)	743.8	743.6

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	plain	5 kg	NIST Class F	0.5 g	0.217 g	---	216 mg	Appd	216 mg	Approved	60 mg	5 kg ws	12-12-2016	CCE5003	-1.10185 mg	
2	single dot	5 kg	NIST Class F	0.5 g	0.175 g	---	174 mg	Appd	174 mg	Approved	60 mg	5 kg ws	12-12-2016	CCE5003	-1.10185 mg	
3	plain	2 kg	NIST Class F	0.2 g	0.099 g	---	84 mg	Appd	84 mg	Approved	24 mg	2 kg ws	3-2-2017	CCE5003	-14.7471 mg	
4	single dot	2 kg	NIST Class F	0.2 g	0.098 g	---	83 mg	Appd	83 mg	Approved	24 mg	2 kg ws	3-2-2017	CCE5003	-14.7471 mg	
5	none	1 kg	NIST Class F	0.1 g	0.025 g	---	25 mg	Appd	25 mg	Approved	13 mg	1 kg ws	12-19-2016	CCE5003	0.37544 mg	
6	A	500 g	NIST Class F	0.07 g	0.035 g	---	35.2 mg	Appd	35.2 mg	Approved	9.2 mg	500 g ws	12-19-2016	CCE5003	0.19215 mg	
7	B	500 g	NIST Class F	0.07 g	0.032 g	---	32.2 mg	Appd	32.2 mg	Approved	9.2 mg	500 g ws	12-19-2016	CCE5003	0.19215 mg	
8	C	500 g	NIST Class F	0.07 g	0.029 g	---	29.2 mg	Appd	29.2 mg	Approved	9.2 mg	500 g ws	12-19-2016	CCE5003	0.19215 mg	
9	D	500 g	NIST Class F	0.07 g	0.029 g	---	29.2 mg	Appd	29.2 mg	Approved	9.2 mg	500 g ws	12-19-2016	CCE5003	0.19215 mg	
10	E	500 g	NIST Class F	0.07 g	0.034 g	---	34.2 mg	Appd	34.2 mg	Approved	9.2 mg	500 g ws	12-19-2016	CCE5003	0.19215 mg	
11	plain	200 g	NIST Class F	0.04 g	0.01622 g	---	16.2 mg	Appd	16.2 mg	Approved	4.7 mg	200 g (pl) ws	12-19-2016	AX205	0.02165 mg	
12	single dot	200 g	NIST Class F	0.04 g	0.01726 g	---	17.3 mg	Appd	17.3 mg	Approved	4.7 mg	200 g (pl) ws	12-19-2016	AX205	0.02165 mg	
13	none	100 g	NIST Class F	0.02 g	0.00726 g	---	7.3 mg	Appd	7.3 mg	Approved	2.4 mg	100 g ws	12-19-2016	AX205	0.03258 mg	
14	none	50 g	NIST Class F	0.01 g	0.00407 g	---	4.1 mg	Appd	4.1 mg	Approved	1.2 mg	50 g ws	12-19-2016	AX205	0.02225 mg	
15	plain	20 g	NIST Class F	0.004 g	0.00159 g	---	1.56 mg	Appd	1.56 mg	Approved	0.48 mg	20 g (pl) ws	12-19-2016	AX205	-0.03071 mg	
16	single dot	20 g	NIST Class F	0.004 g	0.00162 g	---	1.59 mg	Appd	1.59 mg	Approved	0.48 mg	20 g (pl) ws	12-19-2016	AX205	-0.03071 mg	
17	none	10 g	NIST Class F	0.002 g	0.00068 g	---	0.70 mg	Appd	0.70 mg	Approved	0.25 mg	10 g ws	12-19-2016	AX205	0.01596 mg	
18	none	5 g	NIST Class F	0.0015 g	0.00075 g	---	0.73 mg	Appd	0.73 mg	Approved	0.19 mg	5 g ws	12-19-2016	AX205	-0.01931 mg	
19	plain	2 g	NIST Class F	1.1 mg	0.3112 mg	---	0.30 mg	Appd	0.30 mg	Approved	0.13 mg	2 g (pl) ws	12-19-2016	UMT5/6	-0.01147 mg	
20	single dot	2 g	NIST Class F	1.1 mg	0.4383 mg	---	0.43 mg	Appd	0.43 mg	Approved	0.13 mg	2 g (pl) ws	12-19-2016	UMT5/6	-0.01147 mg	
21	none	1 g	NIST Class F	0.9 mg	0.1684 mg	---	0.15 mg	Appd	0.15 mg	Approved	0.11 mg	1 g ws	12-19-2016	UMT5/6	-0.0139 mg	
22					?	---	---	?	---	?	---				---	
23					?	---	---	?	---	?	---				---	

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	ngc	Received weights			
4/24/2017	ngc/acl	Tested weights			
4/25/2017		Returned weights			

Weights Approved 21
Weights Adjusted 0
Weights Rejected 0

METROLOGIST: Nicholas Cone Date: 4/24/17 RECEIVED BY: Quinn A. Roper Date: 4-25-17 RETURNED BY: _____