



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: NC1704-155-W P.O. Number: 17148 Page Number: 1 of 4
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General Description: One set of 30 weights Set Serial Number: LB 001 Manufacturer: Unknown 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)
5	5 lb	Weights	NIST Class F	28 mg	2.02	A, B, C, D, E
5	1 lb	Weights	NIST Class F	9.2 mg	2.02	A, B, C, D, E
2	0.2 lb	Weights	NIST Class F	2.4 mg	2.01	plain, single dot
1	0.1 lb	Weight	NIST Class F	1.8 mg	2.01	none
1	0.05 lb	Weight	NIST Class F	0.91 mg	2.01	none
2	0.02 lb	Weights	NIST Class F	0.37 mg	2.01	plain, single dot
1	0.01 lb	Weight	NIST Class F	0.25 mg	2.01	none
2	0.002 lb	Weights	NIST Class F	0.12 mg	2.02	plain, single dot
1	0.001 lb	Weight	NIST Class F	0.091 mg	2.02	none


NVLAP Lab Code 200495-0

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Form No.: NCM03
Revision Date: 1/5/17
Filename: H:\Standlab\FILESYS\WB_PORTE\2017\NC1704-155-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	8 oz	Weight	NIST Class F	6.7 mg	2.01	none
1	4 oz	Weight	NIST Class F	2.7 mg	2.01	none
1	2 oz	Weight	NIST Class F	1.3 mg	2.01	none
1	1 oz	Weight	NIST Class F	0.64 mg	2.01	none
1	1/2 oz	Weight	NIST Class F	0.34 mg	2.01	none
1	1/4 oz	Weight	NIST Class F	0.22 mg	2.01	none
1	1/8 oz	Weight	NIST Class F	0.17 mg	2.01	none
1	1/16 oz	Weight	NIST Class F	0.13 mg	2.03	none
2	1/32 oz	Weights	NIST Class F	0.10 mg	2.03	plain, single dot

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 NC1704-155-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.



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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 lb ws	NCDA 259	NC1701-019-WD	1-12-2017	CCE5003
1 lb ws	NCDA 258	NC1701-021-WD	1-26-2017	CCE5003
0.2 lb ws	NCDA 257	NC1701-017-WD	1-13-2017	AX205
0.1 lb ws	NCDA 257	NC1701-017-WD	1-13-2017	AX205
0.05 lb ws	NCDA 257	NC1701-017-WD	1-13-2017	AX205
0.02 lb ws	NCDA 257	NC1701-017-WD	1-13-2017	AX205
0.01 lb ws	NCDA 257	NC1701-017-WD	1-13-2017	AX205
0.002 lb ws	NCDA 257	NC1701-017-WD	1-13-2017	UMT5/6
0.001 lb ws	NCDA 257	NC1701-017-WD	1-13-2017	UMT5/6
8 oz ws	NCDA 258	NC1701-017-WD	1-13-2017	CCE5003
4 oz ws	NCDA 258	OBS 17-0699	12-19-2016	AX205
2 oz ws	NCDA 258	OBS 17-0699	12-19-2016	AX205
1 oz ws	NCDA 258	OBS 17-0699	12-19-2016	AX205
1/2 oz ws	NCDA 258	OBS 17-0699	12-19-2016	AX205
1/4 oz ws	NCDA 258	OBS 17-0699	12-19-2016	AX205
1/8 oz ws	NCDA 258	OBS 17-0699	12-19-2016	AX205
1/16 oz ws	NCDA 258	OBS 17-0699	12-19-2016	UMT5/6
1/32 oz ws	NCDA 258	OBS 17-0699	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.



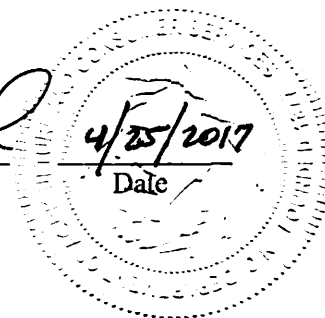
Metrologist

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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NCA&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 30 weights
 Representative: Tommy Albright
 Set Serial Number: LB 001
 Material: Stainless Steel
 Condition of Weights: Good

NC Test No: NC1704-155-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



NVLAP Lab Code 200495-0

Environmental Conditions at Time of Test		
	Beginning	Ending
Temperature (°C)	20.9	21.5
Relative Humidity (%)	55	55
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	A	5 lb	NIST Class F	0.23 g	0.012 g	---	13 mg	Appd	13 mg	Approved	28 mg	5 lb ws	1-12-2017	CCE5003	1.48868 mg	
2	B	5 lb	NIST Class F	0.23 g	0.008 g	---	9 mg	Appd	9 mg	Approved	28 mg	5 lb ws	1-12-2017	CCE5003	1.48868 mg	
3	C	5 lb	NIST Class F	0.23 g	-0.008 g	---	-7 mg	Appd	-7 mg	Approved	28 mg	5 lb ws	1-12-2017	CCE5003	1.48868 mg	
4	D	5 lb	NIST Class F	0.23 g	-0.031 g	---	-30 mg	Appd	-30 mg	Approved	28 mg	5 lb ws	1-12-2017	CCE5003	1.48868 mg	
5	E	5 lb	NIST Class F	0.23 g	0.002 g	---	3 mg	Appd	3 mg	Approved	28 mg	5 lb ws	1-12-2017	CCE5003	1.48868 mg	
6	A	1 lb	NIST Class F	0.07 g	0.006 g	---	9.5 mg	Appd	9.5 mg	Approved	9.2 mg	1 lb ws	1-26-2017	CCE5003	3.48757 mg	
7	B	1 lb	NIST Class F	0.07 g	0.008 g	---	11.5 mg	Appd	11.5 mg	Approved	9.2 mg	1 lb ws	1-26-2017	CCE5003	3.48757 mg	
8	C	1 lb	NIST Class F	0.07 g	0.013 g	---	16.5 mg	Appd	16.5 mg	Approved	9.2 mg	1 lb ws	1-26-2017	CCE5003	3.48757 mg	
9	D	1 lb	NIST Class F	0.07 g	0.009 g	---	12.5 mg	Appd	12.5 mg	Approved	9.2 mg	1 lb ws	1-26-2017	CCE5003	3.48757 mg	
10	E	1 lb	NIST Class F	0.07 g	0.019 g	---	22.5 mg	Appd	22.5 mg	Approved	9.2 mg	1 lb ws	1-26-2017	CCE5003	3.48757 mg	
11	plain	0.2 lb	NIST Class F	0.018 g	-0.01493 g	---	-12.9 mg	Appd	-12.9 mg	Approved	2.4 mg	0.2 lb ws	1-13-2017	AX205	2.06404 mg	
12	single dot	0.2 lb	NIST Class F	0.018 g	0.00167 g	---	3.7 mg	Appd	3.7 mg	Approved	2.4 mg	0.2 lb ws	1-13-2017	AX205	2.06404 mg	
13	none	0.1 lb	NIST Class F	0.0091 g	0.00052 g	---	2.8 mg	Appd	2.8 mg	Approved	1.8 mg	0.1 lb ws	1-13-2017	AX205	2.2379 mg	
14	none	0.05 lb	NIST Class F	0.0045 g	-0.00274 g	---	-0.18 mg	Appd	-0.18 mg	Approved	0.91 mg	0.05 lb ws	1-13-2017	AX205	2.5626 mg	
15	plain	0.02 lb	NIST Class F	0.0018 g	-0.00002 g	---	0.11 mg	Appd	0.11 mg	Approved	0.37 mg	0.02 lb ws	1-13-2017	AX205	0.1334 mg	
16	single dot	0.02 lb	NIST Class F	0.0018 g	0.00040 g	---	0.53 mg	Appd	0.53 mg	Approved	0.37 mg	0.02 lb ws	1-13-2017	AX205	0.1334 mg	
17	none	0.01 lb	NIST Class F	0.0015 g	0.00015 g	---	0.26 mg	Appd	0.26 mg	Approved	0.25 mg	0.01 lb ws	1-13-2017	AX205	0.11397 mg	
18	plain	0.002 lb	NIST Class F	0.87 mg	0.1318 mg	---	0.06 mg	Appd	0.06 mg	Approved	0.12 mg	0.002 lb ws	1-13-2017	UMT5/6	-0.07542 mg	
19	single dot	0.002 lb	NIST Class F	0.87 mg	-0.0100 mg	---	-0.09 mg	Appd	-0.09 mg	Approved	0.12 mg	0.002 lb ws	1-13-2017	UMT5/6	-0.07542 mg	
20	none	0.001 lb	NIST Class F	0.7 mg	-0.2020 mg	---	-0.218 mg	Appd	-0.218 mg	Approved	0.091 mg	0.001 lb ws	1-13-2017	UMT5/6	-0.01612 mg	
21	none	8 oz	NIST Class F	0.045 g	0.020 g	---	21.6 mg	Appd	21.6 mg	Approved	6.7 mg	8 oz ws	1-13-2017	CCE5003	1.62743 mg	
22	none	4 oz	NIST Class F	0.023 g	-0.00211 g	---	-0.9 mg	Appd	-0.9 mg	Approved	2.7 mg	4 oz ws	12-19-2016	AX205	1.21031 mg	
23	none	2 oz	NIST Class F	0.011 g	0.00595 g	---	6.7 mg	Appd	6.7 mg	Approved	1.3 mg	2 oz ws	12-19-2016	AX205	0.71715 mg	
24	none	1 oz	NIST Class F	0.0057 g	0.00032 g	---	0.63 mg	Appd	0.63 mg	Approved	0.64 mg	1 oz ws	12-19-2016	AX205	0.31108 mg	
25	none	1/2 oz	NIST Class F	0.0028 g	0.00067 g	---	0.84 mg	Appd	0.84 mg	Approved	0.34 mg	1/2 oz ws	12-19-2016	AX205	0.16504 mg	
26	none	1/4 oz	NIST Class F	0.0017 g	0.00041 g	---	0.51 mg	Appd	0.51 mg	Approved	0.22 mg	1/4 oz ws	12-19-2016	AX205	0.10352 mg	
27	none	1/8 oz	NIST Class F	0.0013 g	0.00059 g	---	0.64 mg	Appd	0.64 mg	Approved	0.17 mg	1/8 oz ws	12-19-2016	AX205	0.05486 mg	
28	none	1/16 oz	NIST Class F	1.1 mg	0.0254 mg	---	0.41 mg	Appd	0.41 mg	Approved	0.13 mg	1/16 oz ws	12-19-2016	UMT5/6	0.38488 mg	
29	plain	1/32 oz	NIST Class F	0.87 mg	0.0544 mg	---	0.11 mg	Appd	0.11 mg	Approved	0.10 mg	1/32 oz ws	12-19-2016	UMT5/6	0.05739 mg	
30	single dot	1/32 oz	NIST Class F	0.87 mg	0.4414 mg	---	0.50 mg	Appd	0.50 mg	Approved	0.10 mg	1/32 oz ws	12-19-2016	UMT5/6	0.05739 mg	

