



Steve Troxler  
Commissioner

**North Carolina Department of Agriculture  
and Consumer Services**

Stephen Benjamin  
Director

*Standards Division*  
Standards Laboratory

# NC Standards Laboratory Calibration Certificate

<b>Submitted by:</b> Porter Scales 1721 Lake Wheeler Rd. Raleigh, NC 27603	<b>Date of Test:</b> 4/21/2017
	<b>Test Number:</b> NC1704-146-W
	<b>P.O. Number:</b> 17148
	<b>Page Number:</b> 1 of 3

<b>General Description:</b> Forty-one (41) individual weights
<b>Set Serial Number:</b> None
<b>Manufacturer:</b> Unknown
<b>Material:</b> Cast Iron

Item(s) Tested and Approved:						
# of Items	Nominal	Description	Tolerance	Measurement Uncertainty	<i>k</i> Coverage Factor	Serial Number(s) (Listed alphabetically)
41	20 kg	Weights	NIST Class F	240 mg	2.02	SQ 001, SQ 004, SQ 005, SQ 006, SQ 008, SQ 009, SQ 010, WB 300, WB 301, WB 302, WB 303, WB 304, WB 305, WB 306, WB 307, WB 308, WB 309, WB 310, WB 311, WB 312, WB 313, WB 315, WB 317, WB 318, WB 319, WB 321, WB 322, WB 326, WB 330, WB 332, WB 337, WB 339, WB 340, WB 343, WB 346, WB 347, WB 348, WB 350, WB 351, WB 352, WB 353



NVLAP Lab Code 200495-0

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**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 NC1704-146-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.



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**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
20 kg ws	NCDA 261	NC1612-060-WD	12-12-2016	CC50002

**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](http://www.ncagr.com/standard/survey).**

  
 Metrologist

4/21/2017  
 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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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: Forty-one (41) individual weights  
 Representative: Tommy Albright  
 Set Serial Number: None  
 Material: Cast Iron  
 Condition of Weights: Good

NC Test No: NC1704-146-W  
 Purchase Order No: 17148  
 Date Scheduled: April 21, 2017  
 Date Received: April 21, 2017  
 Date Tested: April 21, 2017  
 Date Returned: April 21, 2017  
 Next Appointment: April 25, 2018



NVLAP Lab Code 200495-0

Environmental Conditions at Time of Test		
	Beginning	Ending
Temperature (°C)	20.1	20.1
Relative Humidity (%)	50	50
Barometric Pressure (mmHg)	747.0	746.4

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	SQ 001	20 kg	NIST Class F	2 g	0.300 g	---	310 mg	Appd	310 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
2	SQ 004	20 kg	NIST Class F	2 g	-0.210 g	---	-200 mg	Appd	-200 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
3	SQ 005	20 kg	NIST Class F	2 g	1.630 g	---	1640 mg	Appd	1640 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
4	SQ 006	20 kg	NIST Class F	2 g	-0.760 g	---	-750 mg	Appd	-750 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
5	SQ 008	20 kg	NIST Class F	2 g	0.925 g	---	940 mg	Appd	940 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
6	SQ 009	20 kg	NIST Class F	2 g	0.370 g	---	380 mg	Appd	380 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
7	SQ 010	20 kg	NIST Class F	2 g	-0.045 g	-0.010 g	-30 mg	Appd	0 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
8	WB 300	20 kg	NIST Class F	2 g	1.335 g	---	1350 mg	Appd	1350 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
9	WB 301	20 kg	NIST Class F	2 g	-0.470 g	---	-460 mg	Appd	-460 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
10	WB 302	20 kg	NIST Class F	2 g	0.500 g	---	510 mg	Appd	510 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
11	WB 303	20 kg	NIST Class F	2 g	0.620 g	---	630 mg	Appd	630 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
12	WB 304	20 kg	NIST Class F	2 g	-0.430 g	---	-420 mg	Appd	-420 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
13	WB 305	20 kg	NIST Class F	2 g	0.580 g	---	590 mg	Appd	590 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
14	WB 306	20 kg	NIST Class F	2 g	1.185 g	---	1200 mg	Appd	1200 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
15	WB 307	20 kg	NIST Class F	2 g	0.815 g	---	830 mg	Appd	830 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
16	WB 308	20 kg	NIST Class F	2 g	-0.590 g	---	-580 mg	Appd	-580 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
17	WB 309	20 kg	NIST Class F	2 g	0.600 g	---	610 mg	Appd	610 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
18	WB 310	20 kg	NIST Class F	2 g	-0.555 g	---	-540 mg	Appd	-540 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
19	WB 311	20 kg	NIST Class F	2 g	-0.095 g	---	-80 mg	Appd	-80 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
20	WB 312	20 kg	NIST Class F	2 g	2.725 g	0.045 g	2740 mg	ADJ	60 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
21	WB 313	20 kg	NIST Class F	2 g	0.955 g	---	970 mg	Appd	970 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
22	WB 315	20 kg	NIST Class F	2 g	0.345 g	---	360 mg	Appd	360 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
23	WB 317	20 kg	NIST Class F	2 g	0.660 g	---	670 mg	Appd	670 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
24	WB 318	20 kg	NIST Class F	2 g	-0.435 g	---	-420 mg	Appd	-420 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
25	WB 319	20 kg	NIST Class F	2 g	-0.705 g	---	-690 mg	Appd	-690 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
26	WB 321	20 kg	NIST Class F	2 g	-0.535 g	---	-520 mg	Appd	-520 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
27	WB 322	20 kg	NIST Class F	2 g	1.600 g	---	1610 mg	Appd	1610 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
28	WB 326	20 kg	NIST Class F	2 g	-0.615 g	---	-600 mg	Appd	-600 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
29	WB 330	20 kg	NIST Class F	2 g	0.440 g	---	450 mg	Appd	450 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
30	WB 332	20 kg	NIST Class F	2 g	-0.565 g	---	-550 mg	Appd	-550 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
31	WB 337	20 kg	NIST Class F	2 g	0.630 g	---	640 mg	Appd	640 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
32	WB 339	20 kg	NIST Class F	2 g	0.545 g	---	560 mg	Appd	560 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
33	WB 340	20 kg	NIST Class F	2 g	-0.195 g	---	-180 mg	Appd	-180 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
34	WB 343	20 kg	NIST Class F	2 g	1.220 g	---	1230 mg	Appd	1230 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
35	WB 346	20 kg	NIST Class F	2 g	1.575 g	---	1590 mg	Appd	1590 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
36	WB 347	20 kg	NIST Class F	2 g	1.045 g	---	1060 mg	Appd	1060 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
37	WB 348	20 kg	NIST Class F	2 g	-1.240 g	---	-1230 mg	Appd	-1230 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
38	WB 350	20 kg	NIST Class F	2 g	-1.120 g	---	-1110 mg	Appd	-1110 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
39	WB 351	20 kg	NIST Class F	2 g	-0.690 g	---	-680 mg	Appd	-680 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
40	WB 352	20 kg	NIST Class F	2 g	1.220 g	---	1230 mg	Appd	1230 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		
41	WB 353	20 kg	NIST Class F	2 g	0.140 g	---	150 mg	Appd	150 mg	Approved	240 mg	20 kg ws	12-12-2016	CC50002	14.5205 mg		

