



Receipt Date: March 19, 2018  
Cal. Date: March 19, 2018  
Report Date: March 19, 2018

Report No.: 339118  
Set Serial No.: None  
Barcode: 200960

## Calibration Certificate

ANDERSON INDUSTRIAL SCALES  
4627 ROY LAKE RD  
NISSWA, MN 56468-0629  
Contact: Paul Sechser  
Phone: 218-963-3960  
PO Number: NONE  
Procedure: NIST SOP 8  
Technician ID: 11

Item(s) Submitted: 2500 lb & 3000 lb Weight Carts  
Manufacturer: Anderson  
Weight Type: NA  
Equipment ID: None  
Condition: Excellent  
Temperature: 19.2 °C  
Pressure: 736.7 mmHg  
Relative Humidity: 49.9 %

Nominal Value	Serial No.	CM Correction (g)		NIST HB105-8 Tolerance		k	U (g)
		As Found	As Left	As Found	As Left		
2500 lb		-75	-75	Meets	Meets	2.02	42
3000 lb		214	214	Meets	Meets	2.03	64

The resulting tolerance class of the weight is determined by combining the correction of the weight and the uncertainty of the measurement. The corrections given above correlate to a conventional mass scale versus 8.0 g/cm<sup>3</sup> density and an air density of 1.2 mg/cm<sup>3</sup> at 20 °C. The items listed above have been calibrated using the Standards of the State of Minnesota which are currently in control. These standards are traceable to the SI through NIST. Calibration processes were monitored and found to be in control. All of the tolerances and specifications were evaluated according to NIST Handbook 105-8 (2003). Uncertainty calculations contain the components in NIST SOP 8 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including coverage factors (*k*) calculated at the approximate 95.45 % confidence level. Results apply to items identified in this report only.

Pete Whebbe

Metrologist

Reviewed by:

Erik Alfvin

Metrologist



Receipt Date: March 21, 2018  
Cal. Date: March 21, 2018  
Report Date: March 21, 2018

Report No.: 339128  
Set Serial No.: 1 - 10  
Barcode: 200963

## Calibration Certificate

ANDERSON INDUSTRIAL SCALES  
4627 ROY LAKE RD  
NISSWA, MN 56468-0629  
Contact: PAUL SECHSER  
Phone: 218-963-3960  
PO Number: NONE  
Procedure: NIST SOP 8  
Technician ID: 11

Item(s) Submitted: Cast Cube Weights  
Manufacturer: Assorted  
Weight Type: II  
Equipment ID: None  
Condition: Good  
Temperature: 19.1 °C  
Pressure: 741.1 mmHg  
Relative Humidity: 50.7 %

Nominal Value	Serial No.	CM Correction (g)		NIST HB105-1 Class		k	U (g)
		As Found	As Left	As Found	As Left		
1000 lb	1	0.5	0.5	F	F	2.01	1.6
1000 lb	2	-44.5	1.5	*	F	2.01	1.6
1000 lb	3	-48.5	0.5	*	F	2.01	1.6
1000 lb	4	-34.5	-34.5	F	F	2.01	1.6
1000 lb	5	15.5	15.5	F	F	2.01	1.6
1000 lb	6	-3.5	-3.5	F	F	2.01	1.6
1000 lb	7	4.5	4.5	F	F	2.01	1.6
1000 lb	8	-31.5	-31.5	F	F	2.01	1.6
1000 lb	9	-52.5	0.5	*	F	2.01	1.6
1000 lb	10	-11.5	-11.5	F	F	2.01	1.6

\* Weight(s) as found exceed NIST HB105-1 Class F tolerance.

The resulting tolerance class of the weight is determined by combining the correction of the weight and the uncertainty of the measurement. The corrections given above correlate to a conventional mass scale versus 8.0 g/cm<sup>3</sup> density and an air density of 1.2 mg/cm<sup>3</sup> at 20 °C. The items listed above have been calibrated using the Standards of the State of Minnesota which are currently in control. These standards are traceable to the SI through NIST. Calibration processes were monitored and found to be in control. All of the tolerances and specifications were evaluated according to NIST Handbook 105-1 (1990). Uncertainty calculations contain the components in NIST SOP 8 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including coverage factors (k) calculated at the approximate 95.45 % confidence level. Results apply to items identified in this report only.

Pete Whebbe

Metrologist

Reviewed by:

Erik Alfvín

Metrologist



Receipt Date: March 19, 2018  
Cal. Date: March 19, 2018  
Report Date: March 19, 2018

Report No.: 339119  
Set Serial No.: 11 thru 24  
Barcode: 200959

## Calibration Certificate

ANDERSON INDUSTRIAL SCALES  
4627 ROY LAKE RD  
NISSWA, MN 56848-0629  
Contact: Paul Sechser  
Phone: 218-963-3960  
PO Number: NONE  
Procedure: NIST SOP 8  
Technician ID: 11

Item(s) Submitted: Cast Cube Weights  
Manufacturer: Rice Lake  
Weight Type: II  
Equipment ID: None  
Condition: Excellent  
Temperature: 19.1 °C  
Pressure: 736.7 mmHg  
Relative Humidity: 50.1 %

Nominal Value	Serial No.	CM Correction (g)		NIST HB105-1 Class		k	U (g)
		As Found	As Left	As Found	As Left		
1000 lb	11	26.5	26.5	F	F	2.01	1.6
1000 lb	12	17.5	17.5	F	F	2.01	1.6
1000 lb	13	23.5	23.5	F	F	2.01	1.6
1000 lb	14	34.5	34.5	F	F	2.01	1.6
1000 lb	15	14.5	14.5	F	F	2.01	1.6
1000 lb	16	15.5	15.5	F	F	2.01	1.6
1000 lb	17	21.5	21.5	F	F	2.01	1.6
1000 lb	18	3.5	3.5	F	F	2.01	1.6
1000 lb	19	0.5	0.5	F	F	2.01	1.6
1000 lb	20	1.5	1.5	F	F	2.01	1.6
1000 lb	21	27.5	27.5	F	F	2.01	1.6
1000 lb	22	30.5	30.5	F	F	2.01	1.6
1000 lb	23	37.5	37.5	F	F	2.01	1.6
1000 lb	24	42.5	42.5	F	F	2.01	1.6

The resulting tolerance class of the weight is determined by combining the correction of the weight and the uncertainty of the measurement. The corrections given above correlate to a conventional mass scale versus 8.0 g/cm<sup>3</sup> density and an air density of 1.2 mg/cm<sup>3</sup> at 20 °C. The items listed above have been calibrated using the Standards of the State of Minnesota which are currently in control. These standards are traceable to the SI through NIST. Calibration processes were monitored and found to be in control. All of the tolerances and specifications were evaluated according to NIST Handbook 105-1 (1990). Uncertainty calculations contain the components in NIST SOP 8 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including coverage factors (k) calculated at the approximate 95.45 % confidence level. Results apply to items identified in this report only.

Pete Whebbe

Metrologist

Reviewed by:

Erik Alfvin

Metrologist



Receipt Date: March 19, 2018  
Cal. Date: March 19, 2018  
Report Date: March 19, 2018

Report No.: 339120  
Set Serial No.: 1 - 20  
Barcode: 200961

## Calibration Certificate

ANDERSON INDUSTRIAL SCALES  
4627 ROY LAKE RD  
NISSWA, MN 56468-0629  
Contact: Paul Sechser  
Phone: 218-963-3960  
PO Number: NONE  
Procedure: NIST SOP 8  
Technician ID: 11

Item(s) Submitted: Cast Hand Weights  
Manufacturer: Fairbanks  
Weight Type: II  
Equipment ID: None  
Condition: Good  
Temperature: 19.2 °C  
Pressure: 736.7 mmHg  
Relative Humidity: 49.7 %

Nominal Value	Serial No.	CM Correction (mg)		NIST HB105-1 Class		k	U (mg)
		As Found	As Left	As Found	As Left		
50 lb	1	-546	-546	F	F	2.01	54
50 lb	2	-506	-506	F	F	2.01	54
50 lb	3	-1006	-1006	F	F	2.01	54
50 lb	4	-1686	-1686	F	F	2.01	54
50 lb	5	-1776	-1776	F	F	2.01	54
50 lb	6	-1026	-1026	F	F	2.01	54
50 lb	7	-1556	-1556	F	F	2.01	54
50 lb	8	-2026	-2026	F	F	2.01	54
50 lb	9	-1246	-1246	F	F	2.01	54
50 lb	10	-2056	-2056	F	F	2.01	54
50 lb	11	-1686	-1686	F	F	2.01	54
50 lb	12	-846	-846	F	F	2.01	54
50 lb	13	-1556	-1556	F	F	2.01	54
50 lb	14	-1466	-1466	F	F	2.01	54
50 lb	15	-2236	144	F	F	2.01	54
50 lb	16	-636	-636	F	F	2.01	54
50 lb	17	-1286	-1286	F	F	2.01	54
50 lb	18	-1916	-1916	F	F	2.01	54
50 lb	19	-1006	-1006	F	F	2.01	54
50 lb	20	-676	-676	F	F	2.01	54

The resulting tolerance class of the weight is determined by combining the correction of the weight and the uncertainty of the measurement. The corrections given above correlate to a conventional mass scale versus 8.0 g/cm<sup>3</sup> density and an air density of 1.2 mg/cm<sup>3</sup> at 20 °C. The items listed above have been calibrated using the Standards of the State of Minnesota which are currently in control. These standards are traceable to the SI through NIST. Calibration processes were monitored and found to be in control. All of the tolerances and specifications were evaluated according to NIST Handbook 105-1 (1990). Uncertainty calculations contain the components in NIST SOP 8 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including coverage factors (k) calculated at the approximate 95.45 % confidence level. Results apply to items identified in this report only.

Pete Whebbe

Metrologist

Reviewed by:

Erik Alfvin

Metrologist



Receipt Date: March 19, 2018  
Cal. Date: March 20, 2018  
Report Date: March 20, 2018

Report No.: 339121  
Set Serial No.: 21 - 64  
Barcode: 200962

## Calibration Certificate

ANDERSON INDUSTRIAL SCALES  
4627 ROY LAKE RD  
NISSWA, MN 56468-0629  
Contact: Paul Sechser  
Phone: 218-963-3960  
PO Number: NONE  
Procedure: NIST SOP 8  
Technician ID: 11

Item(s) Submitted: Cast Hand Weights  
Manufacturer: Rice Lake/Assorted  
Weight Type: II  
Equipment ID: None  
Condition: Excellent  
Temperature: 19.2 °C  
Pressure: 738.4 mmHg  
Relative Humidity: 50.3 %

Nominal Value	Serial No.	CM Correction (mg)		NIST HB105-1 Class		k	U (mg)
		As Found	As Left	As Found	As Left		
50 lb	21	-1436	-1436	F	F	2.01	54
50 lb	22	-1256	-1256	F	F	2.01	54
50 lb	23	1214	1214	F	F	2.01	54
50 lb	24	-1586	-1586	F	F	2.01	54
50 lb	25	-206	-206	F	F	2.01	54
50 lb	26	1014	1014	F	F	2.01	54
50 lb	27	-1326	-1326	F	F	2.01	54
50 lb	28	1054	1054	F	F	2.01	54
50 lb	29	-266	-266	F	F	2.01	54
50 lb	30	-1036	-1036	F	F	2.01	54
50 lb	31	-746	-746	F	F	2.01	54
50 lb	32	-2006	-2006	F	F	2.01	54
50 lb	33	-2396	74	*	F	2.01	54
50 lb	34	-616	-616	F	F	2.01	54
50 lb	35	234	234	F	F	2.01	54
50 lb	36	-1556	-1556	F	F	2.01	54
50 lb	37	-2626	234	*	F	2.01	54
50 lb	38	464	464	F	F	2.01	54
50 lb	39	-686	-686	F	F	2.01	54
50 lb	40	-936	-936	F	F	2.01	54
50 lb	41	624	624	F	F	2.01	54
50 lb	42	914	914	F	F	2.01	54
50 lb	43	-216	-216	F	F	2.01	54
50 lb	44	1224	1224	F	F	2.01	54
50 lb	45	-846	-846	F	F	2.01	54
50 lb	46	-976	-976	F	F	2.01	54
50 lb	47	-626	-626	F	F	2.01	54
50 lb	48	474	474	F	F	2.01	54
50 lb	49	-316	-316	F	F	2.01	54
50 lb	50	-616	-616	F	F	2.01	54

\* Weight(s) as found exceed NIST HB105-1 Class F tolerance.





Receipt Date: March 19, 2018  
Cal. Date: March 20, 2018  
Report Date: March 20, 2018

Continued,  
Report No.: 339121  
Set Serial No.: 21 - 64  
Barcode: 200962

## Calibration Certificate

ANDERSON INDUSTRIAL SCALES  
4627 ROY LAKE RD  
NISSWA, MN 56468-0629  
Contact: Paul Sechser  
Phone: 218-963-3960  
PO Number: NONE  
Procedure: NIST SOP 8  
Technician ID: 11

Item(s) Submitted: Cast Hand Weights  
Manufacturer: Rice Lake/Assorted  
Weight Type: II  
Equipment ID: None  
Condition: Excellent  
Temperature: 19.2 °C  
Pressure: 738.4 mmHg  
Relative Humidity: 50.3 %

Nominal Value	Serial No.	CM Correction (mg)		NIST HB105-1 Class		k	U (mg)
		As Found	As Left	As Found	As Left		
50 lb	51	1354	1354	F	F	2.01	54
50 lb	52	1394	1394	F	F	2.01	54
50 lb	53	-266	-266	F	F	2.01	54
50 lb	54	-1286	-1286	F	F	2.01	54
50 lb	55	1424	1424	F	F	2.01	54
50 lb	56	-1186	-1186	F	F	2.01	54
50 lb	57	-346	-346	F	F	2.01	54
50 lb	58	1134	1134	F	F	2.01	54
50 lb	59	564	564	F	F	2.01	54
50 lb	60	-1906	-1906	F	F	2.01	54
25 lb	61	-243	-243	F	F	2.02	32
25 lb	62	-723	-723	F	F	2.02	32
25 lb	63	-1843	147	*	F	2.02	32
25 lb	64	-543	-543	F	F	2.02	32

\* Weight(s) as found exceed NIST HB105-1 Class F tolerance.

The resulting tolerance class of the weight is determined by combining the correction of the weight and the uncertainty of the measurement. The corrections given above correlate to a conventional mass scale versus 8.0 g/cm<sup>3</sup> density and an air density of 1.2 mg/cm<sup>3</sup> at 20 °C. The items listed above have been calibrated using the Standards of the State of Minnesota which are currently in control. These standards are traceable to the SI through NIST. Calibration processes were monitored and found to be in control. All of the tolerances and specifications were evaluated according to NIST Handbook 105-1 (1990). Uncertainty calculations contain the components in NIST SOP 8 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including coverage factors (k) calculated at the approximate 95.45 % confidence level. Results apply to items identified in this report only.

Pete Whebbe

Metrologist

Reviewed by:

Erik Alfvin

Metrologist



Receipt Date: March 19, 2018  
Cal. Date: March 19, 2018  
Report Date: March 19, 2018

Report No.: 339122  
Set Serial No.: None  
Barcode: 202013

## Calibration Certificate

ANDERSON INDUSTRIAL SCALES  
4627 ROY LAKE RD  
NISSWA, MN 56468-0629  
Contact: Paul Sechser  
Phone: 218-963-3960  
PO Number: NONE  
Procedure: NIST SOP 8  
Technician ID: 11

Item(s) Submitted: Cast Hand Weights  
Manufacturer: Rice Lake  
Weight Type: II  
Equipment ID: None  
Condition: Good  
Temperature: 19.2 °C  
Pressure: 736.8 mmHg  
Relative Humidity: 48.7 %

Nominal Value	Serial No.	CM Correction (mg)		ASTM E617 Class		k	U (mg)
		As Found	As Left	As Found	As Left		
10000 g		231	231	6	6	2.04	56
5000 g		55	-11	6	6	2.04	13

The resulting tolerance class of the weight is determined by combining the correction of the weight and the uncertainty of the measurement. The corrections given above correlate to a conventional mass scale versus 8.0 g/cm<sup>3</sup> density and an air density of 1.2 mg/cm<sup>3</sup> at 20 °C. The items listed above have been calibrated using the Standards of the State of Minnesota which are currently in control. These standards are traceable to the SI through NIST. Calibration processes were monitored and found to be in control. All of the tolerances and specifications were evaluated according to ASTM E617 (2013). Uncertainty calculations contain the components in NIST SOP 8 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including coverage factors (k) calculated at the approximate 95.45 % confidence level. Results apply to items identified in this report only.

Pete Whebbe

Metrologist

Reviewed by:

Erik Alfvín

Metrologist



Receipt Date: March 19, 2018  
Cal. Date: March 20, 2018  
Report Date: March 20, 2018

Report No.: 339124  
Set Serial No.: SET 2; 56468  
Barcode: 019790

## Calibration Certificate

ANDERSON INDUSTRIAL SCALES  
4627 ROY LAKE RD  
NISSWA, MN 56468-0629  
Contact: Paul Sechser  
Phone: 218-963-3960  
PO Number: NONE  
Procedure: NIST SOP 8  
Technician ID: 11

Item(s) Submitted: Satin Stainless Weight Kit  
Manufacturer: Rice Lake  
Weight Type: I & II  
Equipment ID: None  
Condition: Good  
Temperature: 19.1 °C  
Pressure: 737.8 mmHg  
Relative Humidity: 50.2 %

Nominal Value	Serial No.	CM Correction (mg)		NIST HB105-1 Class		k	U (mg)
		As Found	As Left	As Found	As Left		
10 lb		129	129	F	F	2.03	11
5 lb		52.2	52.2	F	F	2.03	5.7
2 lb		28.2	28.2	F	F	2.03	2.3
2 lb		12.6	12.6	F	F	2.03	2.3
1 lb		23.1	23.1	F	F	2.03	1.2
0.5 lb		4.70	4.70	F	F	2.03	0.69
0.2 lb		4.66	4.66	F	F	2.03	0.22
0.2 lb		2.19	2.19	F	F	2.03	0.22
0.1 lb		4.49	4.49	F	F	2.03	0.14
0.05 lb		0.41	0.41	F	F	2.03	0.10
0.02 lb		0.344	0.344	F	F	2.03	0.056
0.02 lb		0.672	0.672	F	F	2.03	0.056
0.01 lb		1.031	1.031	F	F	2.03	0.043
0.005 lb		0.367	0.367	F	F	2.03	0.041
0.002 lb		0.206	0.206	F	F	2.03	0.030
0.002 lb		0.129	0.129	F	F	2.03	0.030
0.001 lb		0.496	0.496	F	F	2.03	0.025

The resulting tolerance class of the weight is determined by combining the correction of the weight and the uncertainty of the measurement. The corrections given above correlate to a conventional mass scale versus 8.0 g/cm<sup>3</sup> density and an air density of 1.2 mg/cm<sup>3</sup> at 20 °C. The items listed above have been calibrated using the Standards of the State of Minnesota which are currently in control. These standards are traceable to the SI through NIST. Calibration processes were monitored and found to be in control. All of the tolerances and specifications were evaluated according to NIST Handbook 105-1 (1990). Uncertainty calculations contain the components in NIST SOP 8 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including coverage factors (k) calculated at the approximate 95.45 % confidence level. Results apply to items identified in this report only.

Pete Whebbe

Metrologist

Reviewed by:

Heidi Jones

Laboratory Administrator



Receipt Date: March 19, 2018  
Cal. Date: March 20, 2018  
Report Date: March 21, 2018

Report No.: 339125  
Set Serial No.: SET 5  
Barcode: 019787

## Calibration Certificate

ANDERSON INDUSTRIAL SCALES  
4627 ROY LAKE RD  
NISSWA, MN 56468  
Contact: PAUL SECHSER  
Phone: 218-963-3960  
PO Number: NONE  
Procedure: NIST SOP 8  
Technician ID: 09

Item(s) Submitted: Metric weight set  
Manufacturer: Rice Lake  
Weight Type: I & II  
Equipment ID: None  
Condition: Good  
Temperature: 19.4 °C  
Pressure: 737.6 mmHg  
Relative Humidity: 51.5 %

Nominal Value	Serial No.	CM Correction (mg)		ASTM E617 Class		k	U (mg)
		As Found	As Left	As Found	As Left		
1000		32.5	32.5	5	5	2.04	2.4
500		18.2	18.2	5	5	2.04	1.7
200		6.69	6.69	5	5	2.04	0.53
200		6.97	6.97	5	5	2.04	0.53
100		0.92	0.92	4	4	2.04	0.25
50		0.45	0.45	4	4	2.04	0.16
20		1.41	1.41	5	5	2.04	0.11
20		0.53	0.53	4	4	2.04	0.11
10		0.379	0.379	4	4	2.04	0.070
5		0.337	0.337	5	5	2.03	0.050
2		0.499	0.499	5	5	2.03	0.042
2		0.325	0.325	5	5	2.03	0.042
1		0.171	0.171	5	5	2.04	0.036



Receipt Date: March 19, 2018  
Cal. Date: March 20, 2018  
Report Date: March 21, 2018

Report No.: 339125  
Set Serial No.: SET 5  
Barcode: 019787

Continued,

## Calibration Certificate

ANDERSON INDUSTRIAL SCALES  
4627 ROY LAKE RD  
NISSWA, MN 56468  
Contact: PAUL SECHSER  
Phone: 218-963-3960  
PO Number: NONE  
Procedure: NIST SOP 8  
Technician ID: 09

Item(s) Submitted: Metric weight set  
Manufacturer: Rice Lake  
Weight Type: I & II  
Equipment ID: None  
Condition: Good  
Temperature: 19.4 °C  
Pressure: 737.6 mmHg  
Relative Humidity: 51.5 %

Nominal Value	Serial No.	CM Correction (mg)		ASTM E617 Class		k	U (mg)
		As Found	As Left	As Found	As Left		
0.5 g		0.123	0.123	4	4	2.04	0.021
0.2 g		0.230	0.230	5	5	2.04	0.015
0.2 g		0.182	0.182	5	5	2.04	0.015
0.05 g		0.104	0.104	5	5	2.05	0.011
0.02 g		0.0445	0.0445	4	4	2.05	0.0091
0.01 g		-0.0016	-0.0016	4	4	2.05	0.0084
0.005 g		0.0311	0.0311	4	4	2.07	0.0078
0.002 g		-0.0114	-0.0114	4	4	2.08	0.0071

The resulting tolerance class of the weight is determined by combining the correction of the weight and the uncertainty of the measurement. The corrections given above correlate to a conventional mass scale versus 8.0 g/cm<sup>3</sup> density and an air density of 1.2 mg/cm<sup>3</sup> at 20 °C. The items listed above have been calibrated using the Standards of the State of Minnesota which are currently in control. These standards are traceable to the SI through NIST. Calibration processes were monitored and found to be in control. All of the tolerances and specifications were evaluated according to ASTM E617 (2013). Uncertainty calculations contain the components in NIST SOP 8 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including coverage factors (*k*) calculated at the approximate 95.45 % confidence level. Results apply to

Heidi Jones  
*Heidi Jones*  
Laboratory Administrator

Reviewed by:  
Pete Whebbe  
*Peter Whebbe*  
Metrologist



Receipt Date: March 19, 2018  
Cal. Date: March 20, 2018  
Report Date: March 20, 2018

Report No.: 339123  
Set Serial No.: SET 1, 56801  
Barcode: 019789

## Calibration Certificate

ANDERSON INDUSTRIAL SCALES  
4627 ROY LAKE RD  
NISSWA, MN 56468-0629  
Contact: Paul Sechser  
Phone: 218-963-3960  
PO Number: NONE  
Procedure: NIST SOP 8  
Technician ID: 11

Item(s) Submitted: Satin Stainless Weight Kit  
Manufacturer: Rice Lake  
Weight Type: I & II  
Equipment ID: None  
Condition: Good  
Temperature: 19.1 °C  
Pressure: 737.8 mmHg  
Relative Humidity: 50.2 %

Nominal Value	Serial No.	CM Correction (mg)		NIST HB105-1 Class		k	U (mg)
		As Found	As Left	As Found	As Left		
10 lb		96	96	F	F	2.03	11
5 lb		89.2	89.2	F	F	2.03	5.7
2 lb		26.7	26.7	F	F	2.03	2.3
2 lb		36.1	36.1	F	F	2.03	2.3
1 lb		18.9	18.9	F	F	2.03	1.2
0.5 lb		15.30	15.30	F	F	2.03	0.69
0.2 lb		6.97	6.97	F	F	2.03	0.22
0.2 lb		7.55	7.55	F	F	2.03	0.22
0.1 lb		4.01	4.01	F	F	2.03	0.14
0.05 lb		1.73	1.73	F	F	2.03	0.10
0.02 lb		0.367	0.367	F	F	2.03	0.056
0.02 lb		0.091	0.091	F	F	2.03	0.056
0.01 lb		0.625	0.625	F	F	2.03	0.043
0.005 lb		0.589	0.589	F	F	2.03	0.041
0.002 lb		0.153	0.153	F	F	2.03	0.030
0.002 lb		-0.158	-0.158	F	F	2.03	0.030
0.001 lb		0.310	0.310	F	F	2.03	0.025

The resulting tolerance class of the weight is determined by combining the correction of the weight and the uncertainty of the measurement. The corrections given above correlate to a conventional mass scale versus 8.0 g/cm<sup>3</sup> density and an air density of 1.2 mg/cm<sup>3</sup> at 20 °C. The items listed above have been calibrated using the Standards of the State of Minnesota which are currently in control. These standards are traceable to the SI through NIST. Calibration processes were monitored and found to be in control. All of the tolerances and specifications were evaluated according to NIST Handbook 105-1 (1990). Uncertainty calculations contain the components in NIST SOP 8 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including coverage factors (k) calculated at the approximate 95.45 % confidence level. Results apply to items identified in this report only.

Pete Whebbe

*Pete Whebbe*  
Metrologist

Reviewed by:

Heidi Jones

*Heidi Jones*  
Laboratory Administrator

# United States Department of Commerce

## National Institute of Standards and Technology

Certificate of Metrological Traceability For:

# Minnesota

This laboratory has demonstrated evidence of an unbroken chain of metrological traceability of its standards to the international system of units (SI), documented measurement uncertainties, uses documented measurement procedures, successfully completed training and proficiency tests, documented calibration intervals, submitted a quality management system, and demonstrated suitable measurement assurance for the Scope listed on this certificate.

The Office of Weights and Measures Program assesses laboratories to NIST Handbook 143 - Program Handbook for State Weights and Measures Laboratories and ISO/IEC 17025:2005.

### Scope

<b>Mass Echelon I</b>	<b>Mass Echelon III</b>	<b>Volume Gravimetric, I</b>
20 kg to 1 mg	50 kg to 1 mg	20 L to 10 ml
50 lb to 0.001 lb	5000 lb to 0.001 lb	100 gal to 0.25 gal
<b>Mass Echelon II</b>	4 oz to 0.03125 oz	<b>Volume Transfer, II</b>
20 kg to 1 mg	<b>Weight Carts</b>	1500 gal to 5 gal
1000 lb to 500 lb	10 000 lb to 2000 lb	200 gal to 25 gal LPG
50 lb to 0.001 lb	<b>Wheel Load Weighers</b>	
4 oz to 0.03125 oz	20 000 lb to 2000 lb	
	<b>Railroad Test Cars</b>	
	110 000 lb to 80 000 lb	



2018 to 2019

*Douglas A. Olson*

Douglas A. Olson, Chief  
NIST Office of Weights and Measures

Effective Dates: 2018-01-01 to 2019-12-31