

Inter-Mountain Laboratories, Inc. was purchased by Pace Analytical Services, LLC. In 2019.

Inter-Mountain has been the Hamilton County, Tennessee, contract lab for filter weighing since the beginning of the PM<sub>2.5</sub> program.

Kathy Jones  
Air Monitoring Manager

# Certificate of Accuracy

**Transfer Standard Type: Hg-In-Glass Thermometer**

Certificate No: **T 061620.01**

Transfer standard, model/type: Miller&Weber T3755/P63C Hg-In-Glass Thermometer

Serial number: 3P5742

submitted by/owner: Inter-Mountain Laboratories, Inc.

Air Science Division

555 Absaraka Street

Sheridan, WY 82801

Was compared to Miller & Weber T3755/P63C (sn 3L9452) and ice point.

Miller & Weber Hg-in-glass thermometer sn 3L9452 is traceable to NIST Thermometer 40350, through Transfer Standards 3C4465 & 1Y9716.

Date: 06/16/20

Lab temperature: 22.9 °C  
Barometric Pressure: 658.8 mmHG

Reference Standard (°C)	Transfer Standard (°C)	Difference from Reference (°C)	Transfer Standard Correction* (°C)
0.0	0.0	0.0	0.0
21.8	21.8	0.0	0.0

Ice Point

This Miller & Weber, Inc. high quality liquid-in-glass thermometer, with calibrated ice point, requires only ONE complete calibration in its lifetime (see NIST Special Publication 819 Bibliographic Data Sheet). The tabulated corrections apply provided the ice-point reading, taken after exposure for not fewer than three days to a temperature of about 23°C (73°F), is as shown below. If the ice point reading is found to be higher (or lower) than stated, all other readings will be higher (or lower) by the same amount. If the thermometer is used at a given temperature shortly after being heated to a higher temperature, an error of 0.01° or less for each 10° difference between the two temperatures may be introduced. These corrections apply if the thermometer is used in its upright position.

Reading of Thermometer	Test Temperature	Correction
0.00	0.00	0.00
-6.96	-7.00	-0.04
10.02	10.00	-0.02
20.04	20.00	-0.04
30.03	30.00	-0.03

Certified By: Marty Kjørstad

Date: June 16, 2020

*Chinook Engineering*

a division of Pace Analytical Services, LLC

555 Absaraka Street

Sheridan, Wyoming 82801 USA

(307) 674-7506

[chinook@imlinc.com](mailto:chinook@imlinc.com)

## Certificate of Accuracy

**Transfer Standard Type: Electronic Hygrometer**

Certificate No: H 041020. 02

Transfer standard, model/type: rotronic HC2-S3 HygroClip2  
 Serial Number: NA  
 Probe Serial Number: 20072325  
 submitted by/owner: Inter-Mountain Laboratories, Inc.  
 Air Science Division  
 555 Absaraka Street  
 Sheridan, WY 82801

Was compared to Saturated Salt Solution Standards using ASTM Method E 104 - 02, Standard Practice for Maintaining Constant Relative Humidity by Means of Aqueous Solutions, using Temperature Reference Standard Streamline™ Pro MultiCal™ System Remote Temperature Probe S/N: T030301

Dates: 04/07/2020 - 04/10/2020

Lab temperature: 18 - 23 °C  
 Barometric Pressure: 660 ± 15 mmHg  
 Lab %RH: 30 - 40%

Reference Salt Standard	Reference Temperature °C	Reference Standard (%RH)	Uncertainty	Transfer Standard (%RH)	Difference from Reference (%RH)	Transfer Standard Correction* (%RH)
Lithium Chloride	20.4	11.31	±0.31	11.43	0.12	-0.12
Magnesium Chloride	20.2	33.06	±0.18	32.23	-0.83	0.83
Magnesium Nitrate	20.6	54.20	±0.23	52.33	-1.87	1.87
Sodium Chloride	20.2	75.46	±0.14	72.87	-2.59	2.59
Potassium Sulfate						

Temperature Reference Standard (°C)	Transfer Standard (°C)	Difference from Reference (°C)	Transfer Standard Correction* (°C)
20.4	20.5	0.1	-0.1
20.2	20.5	0.3	-0.3
20.6	20.8	0.2	-0.2
20.2	20.4	0.2	-0.2

Certified by: MAK

Date: April 10, 2020

Marty A. Kjorstad

**Chinook Engineering**  
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 555 Absaraka Street  
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# Certificate of Accuracy

**Transfer Standard Type: Electronic Hygrometer Thermometer**

Transfer standard, model/type: rotronics HC2-S3 HydroClip2

Certificate No: T 041020. 02

Serial number:

Probe S/N: 20072325

submitted by/owner: Pace Analytical Services, LLC

Air Science Division

555 Absaraka Street

Sheridan, WY 82801

**Was compared to:**

Streamline Pro MultiCal System RT Probe Model No. SLPRT203, S/N T030301.

Streamline Pro MultiCal System RT Probe Model No. SLPRT203, S/N T030301 is traceable through NIST Traceable Hg-in-glass thermometers, S/Ns 2Y6027 and 3L9452, and ice point.

Miller & Weber Hg-in-glass thermometer sn 3L9452 is traceable to NIST Thermometer 40350, through Transfer Standards 3C4465 & 1Y9716.

Miller & Weber Hg-in-glass thermometer sn 2Y6027 is traceable to NIST Test No. 209621, Test Method ASTM E-77, through Standard No. 9C8072.

Date: 04/10/20

Lab temperature: 24.3 °C  
Barometric Pressure: 664.0 mmHG

Reference Standard (°C)	Transfer Standard (°C)	Difference from Reference (°C)	Transfer Standard Correction* (°C)
17.4	17.59	0.2	-0.2
20.4	20.50	0.1	-0.1
29.8	29.74	-0.1	0.1

**Note:**

*If no sign is given on the correction, the true temperature is higher than the indicated temperature. If the sign is negative, the true temperature is lower than the indicated temperature.*

Certified By: MAK

Date: April 10, 2020

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# Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001



Cert. No.: 4121-10882734

## Traceable® Certificate of Calibration for Sentry Thermometer °C

Manufactured for and distributed by : Control Company 12554 Galveston Rd B230, Webster, TX 77598

### Instrument Identification:

Model: 4121, S/N: 192649160 Manufacturer: Control Company

### Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Digital Thermometer	140156092	18 Jul 2020	4000-10575348
Temperature Calibration Bath	B5C478		
Temperature Calibration Bath	B96546		
Thermistor Module	B96381	25 Jun 2020	B9626028
Temperature Probe	5392	18 Jun 2020	B9605085

### Certificate Information:

Technician: 420 Procedure: CAL-03 Cal Date: 19 Nov 2019 Cal Due Date: 19 Nov 2021  
Test Conditions: 48.35%RH 21.88°C 1015mBar

### Calibration Data: (New Instrument)

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
°C	N.A.	N.A.		0.00	0	Y	-1	1	0.58	1.72:1
°C	N.A.	N.A.		50.00	50	Y	49	51	0.58	1.72:1

This certificate indicates Traceability to standards provided by (NIST) National Institute of Standards and Technology and/or a National Standards Laboratory.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement": (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ± U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min=As Left Nominal(Rounded) - Tolerance; Max= As Left Nominal(Rounded) + Tolerance;

*Nicol Rodriguez*  
Nicol Rodriguez, Quality Manager

*Aaron Jusko*  
Aaron Jusko, Technical Manager

Note :

### Maintaining Accuracy:

In our opinion once calibrated your Sentry Thermometer °C should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Sentry Thermometer °C change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

### Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

Issue Date : 19 Nov 2019

**CONTROL COMPANY 12554 Galveston RD Suite B230 Webster TX USA 77598**  
Phone 281 482-1714 Fax 281 482-9448 sales@control3.com www.traceable.com

Control Company is an ISO/IEC 17025:2005 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.  
Control Company is ISO 9001:2015 Quality Certified by DNV GL, Certificate No. CERT-01805-2008-AQ-HOU-ANAB.  
International Laboratory Accreditation Cooperation - Multilateral Recognition Arrangement (ILAC-MRA).



Calibration complies with ISO/IEC  
17025, ANSI/NCSL Z540-1, and 9001



Cert. No.: 4121-11152968

**Traceable® Certificate of Calibration for Sentry Thermometer °C**

Manufactured for and distributed by : Control Company 12554 Galveston Rd B230, Webster, TX 77598

**Instrument Identification:**

Model: 4121, S/N: 200165159 Manufacturer: Control Company

**Standards/Equipment:**

Description	Serial Number	Due Date	NIST Traceable Reference
Digital Thermometer	140156092	18 Jul 2020	4000-10575348
Temperature Calibration Bath	B5C478		
Temperature Calibration Bath	B96546		
Thermistor Module	B96381	25 Jun 2020	B9626028
Temperature Probe	5392	18 Jun 2020	B9605085

**Certificate Information:**

Technician: 420 Procedure: CAL-03 Cal Date: 05 Mar 2020 Cal Due Date: 05 Mar 2022  
 Test Conditions: 49.94%RH 22.09°C 1020mBar

**Calibration Data: (New Instrument)**

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
°C	N.A.	N.A.		0.00	-1	Y	-1	1	0.58	1.72:1
°C	N.A.	N.A.		50.00	51	Y	49	51	0.58	1.72:1

This certificate indicates Traceability to standards provided by (NIST) National Institute of Standards and Technology and/or a National Standards Laboratory.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ± U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min=As Left Nominal(Rounded) - Tolerance; Max= As Left Nominal(Rounded) + Tolerance;

*Nicol Rodriguez*  
Nicol Rodriguez, Quality Manager

*Amran Justice*  
Amran Justice, Technical Manager

Note :

**Maintaining Accuracy:**

In our opinion once calibrated your Sentry Thermometer °C should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Sentry Thermometer °C change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

**Recalibration:**

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

Issue Date : 05 Mar 2020

CONTROL COMPANY 12554 Galveston RD Suite B230 Webster TX USA 77598  
 Phone 281 482-1714 Fax 281 482-9448 sales@control3.com www.traceable.com

Control Company is an ISO/IEC 17025:2005 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.  
 Control Company is ISO 9001:2015 Quality Certified by DNV GL, Certificate No. CERT-01895-2006-AQ-HOU-ANAB.  
 International Laboratory Accreditation Cooperation - Multilateral Recognition Arrangement (ILAC-MRA).



Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001



Cert. No.: 4121-11152978

Traceable® Certificate of Calibration for Sentry Thermometer °C

Manufactured for and distributed by : Control Company 12554 Galveston Rd B230, Webster, TX 77598

Instrument Identification:

Model: 4121, S/N: 200165169 Manufacturer: Control Company

Standards/Equipment:

Table with 4 columns: Description, Serial Number, Due Date, NIST Traceable Reference. Rows include Digital Thermometer, Temperature Calibration Bath, Thermistor Module, and Temperature Probe.

Certificate Information:

Technician: 420 Procedure: CAL-03 Cal Date: 05 Mar 2020 Cal Due Date: 05 Mar 2022
Test Conditions: 49.94%RH 22.09°C 1020mBar

Calibration Data: (New Instrument)

Table with 11 columns: Unit(s), Nominal, As Found, In Tol, Nominal, As Left, In Tol, Min, Max, ±U, TUR. Rows show calibration data for 0.00°C and 50.00°C.

This certificate indicates Traceability to standards provided by (NIST) National Institute of Standards and Technology and/or a National Standards Laboratory.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO 'Guide to the Expression of Uncertainty in Measurement' : (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level.

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Nicol Rodriguez (Signature)

Nicol Rodriguez, Quality Manager

Arnon Andino (Signature)

Arnon Andino, Technical Manager

Note :

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International Laboratory Accreditation Cooperation - Multilateral Recognition Arrangement (ILAC-MRA).



**Calibration complies with ISO/IEC  
17025, ANSI/NCSL Z540-1, and 9001**



Cert. No.: 4121-11152985

**Traceable® Certificate of Calibration for Sentry Thermometer °C**

Manufactured for and distributed by : Control Company 12554 Galveston Rd B230, Webster, TX 77598

**Instrument Identification:**

Model: 4121, S/N: 200165176 Manufacturer: Control Company

**Standards/Equipment:**

Description	Serial Number	Due Date	NIST Traceable Reference
Digital Thermometer	140156092	18 Jul 2020	4000-10575348
Temperature Calibration Bath	B5C478		
Temperature Calibration Bath	B96546		
Thermistor Module	B96381	25 Jun 2020	B9628028
Temperature Probe	5392	18 Jun 2020	B9605085

**Certificate Information:**

Technician: 420 Procedure: CAL-03 Cal Date: 05 Mar 2020 Cal Due Date: 05 Mar 2022  
 Test Conditions: 49.94%RH 22.09°C 1020mBar

**Calibration Data: (New Instrument)**

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
°C	N.A.	N.A.		0.00	-1	Y	-1	1	0.58	1.72:1
°C	N.A.	N.A.		50.00	51	Y	49	51	0.58	1.72:1

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A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO 'Guide to the Expression of Uncertainty in Measurement': (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

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*Nicol Rodriguez*

Nicol Rodriguez, Quality Manager

*Aaron Judice*

Aaron Judice, Technical Manager

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 Control Company is ISO 9001:2015 Quality Certified by DNV GL, Certificate No. CERT-01805-2006-AQ-HOU-ANAB.  
 International Laboratory Accreditation Cooperation - Multilateral Recognition Arrangement (ILAC-MRA).



# Annual Repeatability Test

Lab 1 - Balance 3

Date: 07/27/2020  
Analyst: JB + MJ

Test Weight	
Certified Mass:	<u>500.0021mg</u>
Serial Number:	<u>1690</u>

Balance	
Balance Make:	<u>Sartorius</u>
Balance Model:	<u>MS127S</u>
Balance Serial Number:	<u>3440775</u>

## Observations

O <sub>1</sub> w/o Test Weight*:	<u>0.0000</u>	mg
O <sub>3</sub> w/o Test Weight*:	<u>0.0000</u>	mg
O <sub>5</sub> w/o Test Weight*:	<u>0.0000</u>	mg
O <sub>7</sub> w/o Test Weight*:	<u>0.0000</u>	mg
O <sub>9</sub> w/o Test Weight*:	<u>0.0000</u>	mg
O <sub>11</sub> w/o Test Weight*:	<u>0.0000</u>	mg
O <sub>13</sub> w/o Test Weight*:	<u>0.0000</u>	mg
O <sub>15</sub> w/o Test Weight*:	<u>0.0000</u>	mg
O <sub>17</sub> w/o Test Weight*:	<u>0.0000</u>	mg
O <sub>19</sub> w/o Test Weight*:	<u>0.0000</u>	mg

O <sub>2</sub> with Test Weight:	<u>500.0017</u>	mg
O <sub>4</sub> with Test Weight:	<u>500.0019</u>	mg
O <sub>6</sub> with Test Weight:	<u>500.0023</u>	mg
O <sub>8</sub> with Test Weight:	<u>500.0020</u>	mg
O <sub>10</sub> with Test Weight:	<u>500.0019</u>	mg
O <sub>12</sub> with Test Weight:	<u>500.0016</u>	mg
O <sub>14</sub> with Test Weight:	<u>500.0020</u>	mg
O <sub>16</sub> with Test Weight:	<u>500.0017</u>	mg
O <sub>18</sub> with Test Weight:	<u>500.0016</u>	mg
O <sub>20</sub> with Test Weight:	<u>500.0022</u>	mg

Difference:	<u>-500.0017</u>	mg
Difference:	<u>-500.0019</u>	mg
Difference:	<u>-500.0023</u>	mg
Difference:	<u>-500.0020</u>	mg
Difference:	<u>-500.0019</u>	mg
Difference:	<u>-500.0016</u>	mg
Difference:	<u>-500.0020</u>	mg
Difference:	<u>-500.0017</u>	mg
Difference:	<u>-500.0016</u>	mg
Difference:	<u>-500.0022</u>	mg

Standard Deviation of Differences: 0.23  $\mu$ g  
must be within 1  $\mu$ g

\* Do not tare balance



# QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS  
 2340 SE 11<sup>th</sup> Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293  
 (503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com



Pace Analytical  
 555 Absaraka St.  
 Sheridan, WY 82801

Report Number: IMLA0134404765200721

## A2LA ACCREDITED CERTIFICATE OF CALIBRATION WITH DATA

### INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
microbalance	Sartorius	MSU2.7S	34404765	N/A	Lab 1
Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
g	0.0000001	QC012	7/21/20	7/19/19	7/2021

### FUNCTIONAL CHECKS

ECCENTRICITY		LINEARITY		STANDARD DEVIATION			ENVIRONMENTAL CONDITIONS
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:		
2	0.0000025	0.5x4	0.0000009	0.5	0.0000003		<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>As-Found:</b>		<b>As-Found:</b>		1.0.5000000	5.0.5000008	9.0.5000009	Good Fair Poor
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	2.0.5000011	6.0.5000007	10.0.5000006	
<b>As-Left:</b>		<b>As-Left:</b>		3.0.5000012	7.0.5000005	<b>Result</b>	Temperature: 21.7°C
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	4.0.5000010	8.0.5000009	0.00000034	

### A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
2	1.9999885	1.9999870	0.00000643
1	0.9999858	0.9999855	0.00000614
0.5	0.5000020	0.5000000	0.00000614
0.1	0.0999972	0.0999975	0.00000193
0.01	0.0099990	0.0099989	0.00000114
0.005	0.0049984	0.0049991	0.00000114

### CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	Rice Lake	20kg to 1mg	7133	4/24/20	4/2021	20200746

#### Permanent Information Concerning this Equipment:

07/19 Calibration adjustment with customer weight at 500mg. RH=38%

#### Comments/Info Concerning this Calibration:

Report prepared/reviewed by: R.B. Date: 7-21-20

Technician: R. Butcher

Signature: R.B. Butcher

THIS CERTIFICATE SHALL NOT BE REPRODUCED WITHOUT THE APPROVAL OF QUALITY CONTROL SERVICES, INC.

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation and readability of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy. Calibrations comply with ISO/IEC 17025 and ANSI/Z540-1-1994 quality standards.

## Analyst Mass Comparison (Tare Masses)

Analyses Performed:

July 30, 2020

Balance 3

34404765

07/30/20

7:29

Lab 1	3rd	1st	4th	2nd	5th
	Kailey S	Joyce B	Dianna W	Kayla H	Mary H
P2964381	395.4895	395.4872	395.4869	395.4850	395.4857
T8688274	399.6820	399.6820	399.6816	399.6787	399.6816
T8662928	364.8044	364.8036	364.8037	364.8019	364.8034
P2958924	389.2519	389.2520	389.2526	389.2507	389.2522
P2962719	393.4182	393.4203	393.4185	393.4170	393.4189
T8662858	368.4937	368.4940	368.4938	368.4936	368.4940
P2961699	398.6592	398.6603	398.6601	398.6592	398.6590
P2961512	399.1845	399.1852	399.1844	399.1841	399.1845
T7683942	371.5006	371.5050	371.5002	371.4988	371.4994
T8688569	362.7844	362.7853	362.7843	362.7837	362.7825

Average	
1	395.4869
2	399.6812
3	364.8034
4	389.2519
5	393.4186
6	368.4938
7	398.6596
8	399.1845
9	371.5008
10	362.7840

Standard Deviation from the Average					
P2964381	0.19%	0.02%	0.00%	0.13%	0.08%
T8688274	0.06%	0.06%	0.03%	0.18%	0.03%
T8662928	0.07%	0.01%	0.02%	0.11%	0.00%
P2958924	0.00%	0.01%	0.05%	0.08%	0.02%
P2962719	0.03%	0.12%	0.01%	0.11%	0.02%
T8662858	0.01%	0.01%	0.00%	0.02%	0.01%
P2961699	0.03%	0.05%	0.04%	0.03%	0.04%
P2961512	0.00%	0.05%	0.01%	0.03%	0.00%
T7683942	0.01%	0.30%	0.04%	0.14%	0.10%
T8688569	0.03%	0.09%	0.02%	0.02%	0.11%
Average	0.04%	0.07%	0.02%	0.08%	0.04%

Average SD	
1	0.07%
2	0.05%
3	0.04%
4	0.02%
5	0.05%
6	0.01%
7	0.04%
8	0.02%
9	0.12%
10	0.04%

Coefficient of Variation					
P2964381	0.05%	0.01%	0.00%	0.03%	0.02%
T8688274	0.01%	0.01%	0.01%	0.04%	0.01%
T8662928	0.02%	0.00%	0.01%	0.03%	0.00%
P2958924	0.00%	0.00%	0.01%	0.02%	0.01%
P2962719	0.01%	0.03%	0.00%	0.03%	0.01%
T8662858	0.00%	0.00%	0.00%	0.00%	0.00%
P2961699	0.01%	0.01%	0.01%	0.01%	0.01%
P2961512	0.00%	0.01%	0.00%	0.01%	0.00%
T7683942	0.00%	0.08%	0.01%	0.04%	0.03%
T8688569	0.01%	0.02%	0.01%	0.01%	0.03%
Average	0.01%	0.02%	0.01%	0.02%	0.01%

Average CV	
1	0.02%
2	0.01%
3	0.01%
4	0.01%
5	0.01%
6	0.00%
7	0.01%
8	0.00%
9	0.03%
10	0.01%

Difference from Average					
P2964381	0.003	0.000	0.000	-0.002	-0.001
T8688274	0.001	0.001	0.000	-0.002	0.000
T8662928	0.001	0.000	0.000	-0.001	0.000
P2958924	0.000	0.000	0.001	-0.001	0.000
P2962719	0.000	0.002	0.000	-0.002	0.000
T8662858	0.000	0.000	0.000	0.000	0.000
P2961699	0.000	0.001	0.001	0.000	-0.001
P2961512	0.000	0.001	0.000	0.000	0.000
T7683942	0.000	0.004	-0.001	-0.002	-0.001
T8688569	0.000	0.001	0.000	0.000	-0.002
Average	0.000	0.001	0.000	-0.001	0.000

## Certificate of Accuracy

### Transfer Standard Type: Infrared Thermometer

Transfer standard, model/type: VWR Traceable Cat No. 36934-182 Infrared Thermometer Gun

Serial number: 192286084

Certificate No: T 030320. 01

submitted by/owner: IML

555 Absaraka Street  
Sheridan, WY 82801

$\epsilon = 0.95$

Was compared to:

NIST Traceable Hg-in-glass thermometer 3L9452 and ice point.

Miller & Weber Hg-in-glass thermometer S/N 3L9452 is traceable to NIST Thermometer 40350, through Transfer Standards 3C4465 & 1Y9716.

Date: 3/3/2020

Lab temperature: 23.5 °C

Calibration Due: 6/2/2020

Barometric Pressure: 655.4 mmHg

Raw Data Readings			Corrected Readings	
Reference Standard (°C)	Transfer Standard (°C)	Difference from Reference (°C)	Corrected Transfer Standard (°C)	Difference from Reference (°C)
0.0	0.1	0.1	0.1	0.1
1.0	1.1	0.1	1.1	0.1
2.0	2.0	0.0	2.0	0.0
3.0	3.0	0.0	3.0	0.0
4.0	4.0	0.0	4.0	0.0
5.0	5.0	0.0	5.0	0.0
6.0	5.8	-0.2	5.8	-0.2
7.0	6.8	-0.2	6.8	-0.2
8.0	8.0	0.0	8.0	0.0
9.0	9.0	0.0	9.0	0.0
10.0	10.4	0.4	10.3	0.3

Calculated Correction Curve: °C = 0.993 x (Transfer Standard) + 0.016

$R^2 = 0.998$

**Note:**

If no sign is given on the correction, the true temperature is higher than the indicated temperature. If the sign is negative, the true temperature is lower than the indicated temperature.

Certified By: RLS

Date: March 3, 2020

Roger L. Sanders

*Chinook Engineering*

a division of Pace Analytical Services, LLC

555 Absaraka Street

Sheridan, Wyoming 82801 USA

(307) 674-7506

[chinook@imlinc.com](mailto:chinook@imlinc.com)

Transfer standard, model/type:

VWR Traceable Cat No. 36934-182 Infrared Thermometer Gun

# IR GUN CORRECTED READINGS

Serial number: 192286084

m= 0.993

Corrected Reading = m x (IR Reading) + b

$\epsilon = 0.95$

Cert. Date: March 3, 2020

b= 0.016

Corrected Reading = 0.993 x (IR Reading) + 0.016 °C

(°C) IR Reading	Corrected Reading
0.0	0.0
0.1	0.1
0.2	0.2
0.3	0.3
0.4	0.4
0.5	0.5
0.6	0.6
0.7	0.7
0.8	0.8
0.9	0.9
1.0	1.0
1.1	1.1
1.2	1.2
1.3	1.3
1.4	1.4
1.5	1.5
1.6	1.6
1.7	1.7
1.8	1.8

(°C) IR Reading	Corrected Reading
1.9	1.9
2.0	2.0
2.1	2.1
2.2	2.2
2.3	2.3
2.4	2.4
2.5	2.5
2.6	2.6
2.7	2.7
2.8	2.8
2.9	2.9
3.0	3.0
3.1	3.1
3.2	3.2
3.3	3.3
3.4	3.4
3.5	3.5
3.6	3.6
3.7	3.7

(°C) IR Reading	Corrected Reading
3.8	3.8
3.9	3.9
4.0	4.0
4.1	4.1
4.2	4.2
4.3	4.3
4.4	4.4
4.5	4.5
4.6	4.6
4.7	4.7
4.8	4.8
4.9	4.9
5.0	5.0
5.1	5.1
5.2	5.2
5.3	5.3
5.4	5.4
5.5	5.5
5.6	5.6

(°C) IR Reading	Corrected Reading
5.7	5.7
5.8	5.8
5.9	5.9
6.0	6.0
6.1	6.1
6.2	6.2
6.3	6.3
6.4	6.4
6.5	6.5
6.6	6.6
6.7	6.7
6.8	6.8
6.9	6.9
7.0	7.0
7.1	7.1
7.2	7.2
7.3	7.3
7.4	7.4
7.5	7.5

(°C) IR Reading	Corrected Reading
7.6	7.6
7.7	7.7
7.8	7.8
7.9	7.9
8.0	8.0
8.1	8.1
8.2	8.2
8.3	8.3
8.4	8.4
8.5	8.5
8.6	8.6
8.7	8.7
8.8	8.8
8.9	8.9
9.0	9.0
9.1	9.1
9.2	9.2
9.3	9.3
9.4	9.4

(°C) IR Reading	Corrected Reading
9.5	9.4
9.6	9.5
9.7	9.6
9.8	9.7
9.9	9.8
10.0	9.9
10.1	10.0
10.2	10.1
10.3	10.2
10.4	10.3
10.5	10.4
10.6	10.5
10.7	10.6
10.8	10.7
10.9	10.8
11.0	10.9
11.1	11.0
11.2	11.1
11.3	11.2

## Certificate of Accuracy

### Transfer Standard Type: Infrared Thermometer

Transfer standard, model/type: VWR Traceable Cat No. 36934-182 Infrared Thermometer Gun  
 Serial number: 192286084 Certificate No: T 052920. 01

submitted by/owner: IML

555 Absaraka Street  
 Sheridan, WY 82801

$\epsilon = 0.95$

Was compared to:

NIST Traceable Hg-in-glass thermometer 3L9452 and ice point.

Miller & Weber Hg-in-glass thermometer S/N 3L9452 is traceable to NIST Thermometer 40350, through Transfer Standards 3C4465 & 1Y9716.

Date: 5/29/2020  
 Calibration Due: 8/28/2020

Lab temperature: 22.7 °C  
 Barometric Pressure: 662.3 mmHg

Raw Data Readings			Corrected Readings	
Reference Standard (°C)	Transfer Standard (°C)	Difference from Reference (°C)	Corrected Transfer Standard (°C)	Difference from Reference (°C)
0.0	0.0	0.0	0.0	0.0
1.0	1.1	0.1	1.1	0.1
2.0	2.0	0.0	2.0	0.0
3.0	2.9	-0.1	2.9	-0.1
4.0	3.9	-0.1	3.9	-0.1
5.0	5.0	0.0	5.0	0.0
6.0	6.1	0.1	6.0	0.0
7.0	7.1	0.1	7.0	0.0
8.0	8.3	0.3	8.2	0.2
9.0	9.0	0.0	8.9	-0.1
10.0	10.1	0.1	10.0	0.0

Calculated Correction Curve: °C = 0.985 x (Transfer Standard) + 0.031  
 $R^2 = 0.999$

**Note:**

*If no sign is given on the correction, the true temperature is higher than the indicated temperature. If the sign is negative, the true temperature is lower than the indicated temperature.*

Certified By: Paul Dumond

Date: May 29, 2020

Roger L. Sanders

### Chinook Engineering

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[chinook@imlinc.com](mailto:chinook@imlinc.com)

**IR GUN CORRECTED READINGS**

VWR Traceable Cat No. 36934-182 Infrared Thermometer Gun

Transfer standard, model/type:

Serial number: 192286084

m= 0.985

Corrected Reading = m x (IR Reading) + b

$\epsilon = 0.95$

Cert. Date: May 29, 2020

b= 0.031

Corrected Reading =  $0.985 \times (\text{IR Reading}) + 0.031 \text{ } ^\circ\text{C}$

(°C) IR Reading	Corrected Reading
0.0	0.0
0.1	0.1
0.2	0.2
0.3	0.3
0.4	0.4
0.5	0.5
0.6	0.6
0.7	0.7
0.8	0.8
0.9	0.9
1.0	1.0
1.1	1.1
1.2	1.2
1.3	1.3
1.4	1.4
1.5	1.5
1.6	1.6
1.7	1.7
1.8	1.8

(°C) IR Reading	Corrected Reading
1.9	1.9
2.0	2.0
2.1	2.1
2.2	2.2
2.3	2.3
2.4	2.4
2.5	2.5
2.6	2.6
2.7	2.7
2.8	2.8
2.9	2.9
3.0	3.0
3.1	3.1
3.2	3.2
3.3	3.3
3.4	3.4
3.5	3.5
3.6	3.6
3.7	3.7

(°C) IR Reading	Corrected Reading
3.8	3.8
3.9	3.9
4.0	4.0
4.1	4.1
4.2	4.2
4.3	4.3
4.4	4.4
4.5	4.5
4.6	4.6
4.7	4.7
4.8	4.8
4.9	4.9
5.0	5.0
5.1	5.1
5.2	5.2
5.3	5.3
5.4	5.4
5.5	5.4
5.6	5.5

(°C) IR Reading	Corrected Reading
5.7	5.6
5.8	5.7
5.9	5.8
6.0	5.9
6.1	6.0
6.2	6.1
6.3	6.2
6.4	6.3
6.5	6.4
6.6	6.5
6.7	6.6
6.8	6.7
6.9	6.8
7.0	6.9
7.1	7.0
7.2	7.1
7.3	7.2
7.4	7.3
7.5	7.4

(°C) IR Reading	Corrected Reading
7.6	7.5
7.7	7.6
7.8	7.7
7.9	7.8
8.0	7.9
8.1	8.0
8.2	8.1
8.3	8.2
8.4	8.3
8.5	8.4
8.6	8.5
8.7	8.6
8.8	8.7
8.9	8.8
9.0	8.9
9.1	9.0
9.2	9.1
9.3	9.2
9.4	9.3

(°C) IR Reading	Corrected Reading
9.5	9.4
9.6	9.5
9.7	9.6
9.8	9.7
9.9	9.8
10.0	9.9
10.1	10.0
10.2	10.1
10.3	10.2
10.4	10.3
10.5	10.4
10.6	10.5
10.7	10.6
10.8	10.7
10.9	10.8
11.0	10.9
11.1	11.0
11.2	11.1
11.3	11.2

# Working Standard Mass Verification

## Lab 1 - Balance 3

Date: 03/02/20  
 Analyst: MH

### Balance

Balance Make:	Sartorius
Balance Model:	MSU2.7S-000 DM
Balance Serial Number:	34404765

### Working Standard

Nominal Mass ( $N_w$ ):	500
Serial Number:	1690
Certified Conventional Mass ( $C_w$ ):	500.0021

### Primary Standard

Nominal Mass ( $N_p$ ):	500
Serial Number:	44620
Certified Conventional Mass ( $C_p$ ):	500.0007

### Observations

$O_1$ Working Standard:	<input type="text" value="500.0016"/>	mg
$O_2$ Primary Standard:	<input type="text" value="500.0013"/>	mg
$O_3$ Primary Standard:	<input type="text" value="500.0012"/>	mg
$O_4$ Working Standard:	<input type="text" value="500.0016"/>	mg
Apparent Mass Correction:	<input type="text" value="500.00035"/>	mg
Difference:	<input type="text" value="1.6"/>	$\mu\text{g}$
	must be within $\pm 2\mu\text{g}$	

$$\text{Apparent mass correction} = C_p + \frac{O_1 - O_2 + O_4 - O_3}{2} + N_p - N_w$$

$$\text{Difference} = C_w^* - \text{Apparent Mass Correction}$$

\* Working and Primary Conventional mass values are truncated to three decimal places



# Working Standard Mass Verification

## Lab 1 - Balance 3

Date: 05/26/20  
 Analyst: MH & DW

### Balance

Balance Make:	Sartorius
Balance Model:	MSU2.7S-000 DM
Balance Serial Number:	34404765

### Working Standard

Nominal Mass ( $N_w$ ):	500
Serial Number:	1690
Certified Conventional Mass ( $C_w$ ):	500.0021

### Primary Standard

Nominal Mass ( $N_p$ ):	500
Serial Number:	1000188167
Certified Conventional Mass ( $C_p$ ):	500.0010

### Observations

$O_1$ Working Standard:	<input type="text" value="500.0034"/>	mg
$O_2$ Primary Standard:	<input type="text" value="500.0013"/>	mg
$O_3$ Primary Standard:	<input type="text" value="500.0016"/>	mg
$O_4$ Working Standard:	<input type="text" value="500.0036"/>	mg
Apparent Mass Correction:	<input type="text" value="500.00305"/>	mg
Difference:	<input type="text" value="-1.0"/>	$\mu\text{g}$

must be within  $\pm 2\mu\text{g}$

$$\text{Apparent mass correction} = C_p + \frac{O_1 - O_2 + O_4 - O_3}{2} + N_p - N_w$$

$$\text{Difference} = C_w^* - \text{Apparent Mass Correction}$$

\* Working and Primary Conventional mass values are truncated to three decimal places

# Working Standard Mass Verification

## Lab 1 - Balance 3

Date: 03/02/20  
 Analyst: MH

### Balance

Balance Make:	Sartorius
Balance Model:	MSU2.7S-000 DM
Balance Serial Number:	34404765

### Working Standard

Nominal Mass ( $N_w$ ):	200
Serial Number:	1000105800
Certified Conventional Mass ( $C_w$ ):	200.0007

### Primary Standard

Nominal Mass ( $N_p$ ):	200
Serial Number:	6578
Certified Conventional Mass ( $C_p$ ):	199.9980

### Observations

O <sub>1</sub> Working Standard:	<input type="text" value="200.0001"/>	mg
O <sub>2</sub> Primary Standard:	<input type="text" value="199.9995"/>	mg
O <sub>3</sub> Primary Standard:	<input type="text" value="199.9996"/>	mg
O <sub>4</sub> Working Standard:	<input type="text" value="200.0001"/>	mg
Apparent Mass Correction:	<input type="text" value="199.99855"/>	mg
Difference:	<input type="text" value="1.45"/>	µg
must be within ±2µg		

$$\text{Apparent mass correction} = C_p + \frac{O_1 - O_2 + O_4 - O_3}{2} + N_p - N_w$$

$$\text{Difference} = C_w^* - \text{Apparent Mass Correction}$$

\* Working and Primary Conventional mass values are truncated to three decimal places

# Working Standard Mass Verification

## Lab 1 - Balance 3

Date: 05/26/20  
 Analyst: MH / DW

### Balance

Balance Make:	Sartorius
Balance Model:	MSU2.7S-000 DM
Balance Serial Number:	34404765

### Working Standard

Nominal Mass ( $N_w$ ):	200
Serial Number:	1000105800
Certified Conventional Mass ( $C_w$ ):	200.0007

### Primary Standard

Nominal Mass ( $N_p$ ):	200
Serial Number:	6578
Certified Conventional Mass ( $C_p$ ):	199.9980

### Observations

$O_1$ Working Standard:	<input type="text" value="200.0008"/>	mg
$O_2$ Primary Standard:	<input type="text" value="199.9996"/>	mg
$O_3$ Primary Standard:	<input type="text" value="199.9995"/>	mg
$O_4$ Working Standard:	<input type="text" value="200.0008"/>	mg
Apparent Mass Correction:	<input type="text" value="199.99925"/>	mg
Difference:	<input type="text" value="0.75"/>	$\mu\text{g}$

must be within  $\pm 2\mu\text{g}$

$$\text{Apparent mass correction} = C_p + \frac{O_1 - O_2 + O_4 - O_3}{2} + N_p - N_w$$

$$\text{Difference} = C_w^* - \text{Apparent Mass Correction}$$

\* Working and Primary Conventional mass values are truncated to three decimal places

Filter Stability Evaluation (Lot Blank)

Filter Lot Number : 240

Network Arizona

Filter Box numbers Represented 72510, 72421, 72422

Date Received (initial shipment): 1/21/20

Date		Time & Initials		Time & Initials		Time & Initials		Time & Initials		Working Standards
Analyst Initials	KS	KS	10:10	KS	12:00	KS	16:35			
<b>Filter ID</b>		<b>Filter ID</b>	<b>Filter ID</b>	<b>Filter ID</b>	<b>Filter ID</b>	<b>Filter ID</b>	<b>Filter ID</b>	<b>Filter ID</b>	<b>Filter ID</b>	
WS4-450 mg	499.9998	WS4	WS4	WS4	499.9999	WS4	499.9999	WS4	499.9999	450 mg - 500 mg
WS2-200 mg	199.9996	WS2	WS2	WS2	199.9996	WS2	199.9996	WS2	199.9996	SN: 34473
Zero	0.0000	Zero	Zero	Zero	0.0000	Zero	0.0000	Zero	0.0000	Certified Conventional Mass
Lot B1	409.9721	Lot B1	Lot B1	Lot B1	409.9736	Lot B1	409.9742	Lot B1	409.9742	499.9991
Lot B2	406.4262	Lot B2	Lot B2	Lot B2	406.4279	Lot B2	406.4279	Lot B2	406.4279	200 mg
Lot B3	401.8491	Lot B3	Lot B3	Lot B3	401.8500	Lot B3	401.8516	Lot B3	401.8516	SN: 1000109300
Lot B4	407.0724	Lot B4	Lot B4	Lot B4	407.0741	Lot B4	407.0745	Lot B4	407.0741	Certified Conventional Mass
Lot B5	410.0114	Lot B5	Lot B5	Lot B5	410.0131	Lot B5	410.0136	Lot B5	410.0136	SN: 999-6603-20000071
Lot B6	407.7102	Lot B6	Lot B6	Lot B6	407.7095	Lot B6	407.7095	Lot B6	407.7108	3/2/20 Comments:
Lot B7	409.8818	Lot B7	Lot B7	Lot B7	409.8828	Lot B7	409.8828	Lot B7	409.8828	
Lot B8	412.2849	Lot B8	Lot B8	Lot B8	412.2835	Lot B8	412.2835	Lot B8	412.2830	
Lot B9	402.3568	Lot B9	Lot B9	Lot B9	402.3555	Lot B9	402.3556	Lot B9	402.3535	
WS4-450 mg	500.0009	WS4	WS4	WS4	500.0009	WS4	500.0007	WS4	500.0019	3/2/20: changed 500mg standard
WS2-200 mg	199.9996	WS2	WS2	WS2	200.0002	WS2	200.0001	WS2	200.0021	3/1 4180 = 500.0021
Zero	0.0000	Zero	Zero	Zero	0.0000	Zero	0.0000	Zero	0.0000	
Date & Time										
Analyst Initials										
		1-2	2-3	3-4						
<b>Filter ID</b>		<b>Difference (mg)</b>	<b>Difference (mg)</b>	<b>Difference (mg)</b>	<b>Difference (mg)</b>	<b>Difference (mg)</b>	<b>Difference (mg)</b>	<b>Difference (mg)</b>	<b>Difference (mg)</b>	
WS4-450 mg										4-5
WS2-200 mg										96 Hrs Day 5 Mass (mg)
Zero										
Lot B1										
Lot B2										
Lot B3										
Lot B4										
Lot B5										
Lot B6										
Lot B7										
Lot B8										
Lot B9										
WS4-450 mg										
WS2-200 mg										
Zero										
Day 1 Initial Mass (mg)										
Day 2 Initial Mass (mg)										
Day 3 Initial Mass (mg)										
Day 4 Initial Mass (mg)										
Day 5 Initial Mass (mg)										
Day 6 Initial Mass (mg)										

**SUMMARY OF TEMPERATURE AND RELATIVE HUMIDITY VERIFICATION**

**Laboratory (Lab #1)**

**January 2020- December 2020**

Date of Verification	Datalogger Temp °C	Reference Temp °C	Degree Difference	Datalogger RH %	Reference RH %	Percent Difference
01/16/20	21.1	20.6	0.5	35.6	36.1	-0.5
02/18/20	21.1	22.3	-1.2	35.5	37.4	-1.9
03/18/20	21.1	21.3	-0.2	35.5	36.2	-0.7
04/17/20	21.1	20.8	0.3	35.6	35.7	-0.1
04/17/20	21.1	21.0	0.1	35.5	35.7	-0.2
05/19/20	21.8	21.7	0.1	36.1	36.5	-0.4
06/18/20	21.7	21.6	0.1	35.7	36.1	-0.4
07/21/20	21.6	21.6	0.0	36.0	36.4	-0.4

**Temperature and Relative Humidity Probe**

ro-tronic Device Type HC2-S3 SN# 0061247681

ro-tronic Device Type HC2-S3 SN#20002088 Change out probe 04/17/20

Campbell Scientific CR 1000 Datalogger SN # 79237

**Certified Standards - Reference**

ro-tronic Device Type HC2-S3 SN# 0020072325

Campbell Scientific CR 6 Datalogger SN # 5651

**Acceptance Criteria**

Relative Humidity ± 2.0% \*

Temperature ± 2.0°C

*\* For Laboratory and Data Management Support of the Determination of Fine Particulate Matter as PM<sub>2.5</sub>, PM<sub>10</sub> and Coarse Particulate Matter as PM<sub>10-2.5</sub> in the Atmosphere, Quality Assurance Project Plan Revision #14 Reference SOP ML-APPLO312-2.1*

# ISO/IEC 17025 Calibration Certificate



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Page 1 of 7 Pages  
Weight

## SECTION 1: NAME AND ADDRESS OF CUSTOMER

Certificate Number 01076160A-1  
Date of Calibration 22-MAY-2019

**End user**  
Inter Mountain Laboratories  
555 Absaraka Street  
Air Science  
Sheridan WY 82801

**Client**  
Inter-Mountain Laboratories  
PO BOX 4006  
Sheridan WY 82801-0661

## SECTION 2: APPROVED SIGNATORY

  
Jillian Shipe, Metrologist

## SECTION 3: PERSON PERFORMING WORK

Robotic Calibration

## SECTION 4: CERTIFICATE INFORMATION

Description of Masses: Analytical Weight

Accuracy Class	: Troemner Ultra Class *	Date Received	: 09-MAY-2019
Order Number	: 246768	Date of Calibration	: 22-MAY-2019
Construction	: One Piece	Date of Issue	: 24-MAY-2019
Material	: Stainless Steel	Weight Range	: 500mg

## SECTION 5: ENVIRONMENTAL CONDITIONS DURING TEST

Temperature: 22.06 °C      Pressure: 757.02 mm Hg      Relative Humidity: 49%

## SECTION 6: PERTINENT INFORMATION

The Weights listed on this calibration report have been compared to reference mass standards that are traceable to the SI through the National Institute of Standards and Technology under Test No. 684/289871-17.

Reference standards and balances used to perform the calibration are listed in Section 10.

The weights calibrated for this report have been calibrated in accordance with Troemner's calibration process. The calibration performed meets the criteria as described in the current revisions of ASTM E617 and OIML R111.

This calibration also meets specifications as outlined in ISO/IEC 17025, ANSI/NCSL Z540-1-1994, and applicable documents.

\* Troemner's Ultra Class is an enhanced group of weight tolerances which are equal to ASTM E617 Class 0

## ISO/IEC 17025 Calibration Certificate



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Page 2 of 7 Pages  
Weight

NAME AND ADDRESS OF CUSTOMER

Certificate Number 01076160A-1  
Date of Calibration 22-MAY-2019

End user

Inter Mountain Laboratories  
555 Absaraka Street  
Air Science  
Sheridan WY 82801

Client

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PO BOX 4006  
Sheridan WY 82801-0661

### SECTION 7: TRUE MASS (MASS IN VACUUM) CALIBRATION DATA

Nominal Mass Value	Notes	Serial Number	----- True Mass ----- As Found	----- As Left	Density <sup>1</sup> of Weight	Uncertainty ( + or - )
500 mg	XF	3444	0.4999966 g		7.9500 g/cm <sup>3</sup>	0.0012 mg
500 mg	N	44620		0.5000011 g	7.9500 g/cm <sup>3</sup>	0.0012 mg

<sup>1</sup> Density is assumed unless otherwise stated  
N Denotes new weight. X Denotes weight labeled out of tolerance. F Denotes failed As Found tolerance test.

Page 3 of 7 Pages  
**Weight**

NAME AND ADDRESS OF CUSTOMER

Certificate Number 01076160A-1  
Date of Calibration 22-MAY-2019

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Inter Mountain Laboratories  
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Sheridan WY 82801

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PO BOX 4006  
Sheridan WY 82801-0661

SECTION 8: CONVENTIONAL MASS CALIBRATION VALUE VS. REFERENCE DENSITY 8000 kg/m<sup>3</sup>

Nominal Mass Value	Notes	Serial Number	---- Conventional Mass Value ----		Uncertainty ( + or - )	Tolerance <sup>u</sup> ( + or - )
			As Found	As Left		
500 mg XF		3444	0.4999961 g		0.0012 mg	0.0050 mg
500 mg N		44620		0.5000007 g	0.0012 mg	0.0050 mg

N Denotes new weight. X Denotes weight labeled out of tolerance. F Denotes failed As Found tolerance test.



# ISO/IEC 17025 Calibration Certificate



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Page 4 of 7 Pages  
Weight

**NAME AND ADDRESS OF CUSTOMER**

Certificate Number 01076160A-1  
Date of Calibration 22-MAY-2019

End user  
Inter Mountain Laboratories  
555 Absaraka Street  
Air Science  
Sheridan WY 82801

Client  
Inter-Mountain Laboratories  
PO BOX 4006  
Sheridan WY 82801-0661

**SECTION 9: CONVENTIONAL MASS CALIBRATION DATA VS. REFERENCE DENSITY 8000 kg/m<sup>3</sup>**

Nominal Mass Value	Serial Number	-- Conventional Mass Correction --		Uncertainty	Tolerance <sup>u</sup>
Notes		As Found	As Left	( + or - )	( + or - )
500 mg XF	3444	-0.0039 mg		0.0012 mg	0.0050 mg
500 mg N	44620		0.0007 mg	0.0012 mg	0.0050 mg

N Denotes new weight. X Denotes weight labeled out of tolerance. F Denotes failed As Found tolerance test.

# ISO/IEC 17025 Calibration Certificate



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Weight

NAME AND ADDRESS OF CUSTOMER

Certificate Number 01076160A-1  
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Air Science  
Sheridan WY 82801

Client  
Inter-Mountain Laboratories  
PO BOX 4006  
Sheridan WY 82801-0661

## SECTION 10: CALIBRATION PROCEDURE DATA

Nominal Mass Value	Serial Number	Standard Set No.	Cal Due	Balance Used	Cal Due	Procedure Used
500 mg X	3444	8120A	08/01/19	A5XL-134	01/01/20	Multi A-B
500 mg N	44620	8121A	07/01/19	XP6-116	06/01/19	Multi A-B

N Denotes new weight. X Denotes weight labeled out of tolerance.

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Weight

NAME AND ADDRESS OF CUSTOMER

Certificate Number 01076160A-1  
Date of Calibration 22-MAY-2019

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555 Absaraka Street  
Air Science  
Sheridan WY 82801

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Inter-Mountain Laboratories  
PO BOX 4006  
Sheridan WY 82801-0661

## SECTION 11: GENERAL INFORMATION

This calibration was performed in Troemner's High Precision Level I Mass Metrology Laboratory at 201 Wolf Drive, Thorofare, New Jersey 08086 unless otherwise noted on the Addendum. The internal procedures used are CAL-CLASSI and METR-MAP.

## SECTION 12: DEFINITIONS AND TERMS

**TRUE MASS** - The mass of a weight as if it were measured in a vacuum. Also known as Mass in a Vacuum.

**CONVENTIONAL MASS** - The conventional value of the result of weighing in air in accordance to International Recommendation OIML D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of a density of 8000 kg/m<sup>3</sup> which it balances in air of a density of 1.2 kg/m<sup>3</sup>.

**AS FOUND TRUE MASS** - The measured value of the mass(es) as they were received by Troemner.

**AS LEFT TRUE MASS** - The measured value of the mass(es) after adjustment, repair, or replacement when necessary. The As Found True Mass will equal the As Left True Mass if the mass(es) did not require adjustment, repair or replacement.

**NOMINAL MASS** - The mass value as marked on the weight.

**CORRECTION** - The difference between the conventional mass value of a weight and its nominal value. A positive correction indicates that the conventional mass value is greater than the nominal value by the amount of the correction.

**AS FOUND CONVENTIONAL MASS CORRECTION** - The conventional correction of the result, as it was received by Troemner, of weighing in air in accordance to International Recommendation D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of density 8000 kg/m<sup>3</sup>, which it balances in air density of 1.2 kg/m<sup>3</sup>. If the customer requires cleaning prior to calibration, the after cleaning correction would be reported.

**AS LEFT CONVENTIONAL MASS CORRECTION** - The conventional correction of the result, after adjustment, repair, or replacement of weighing in air in accordance to International Recommendation D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of density 8000 kg/m<sup>3</sup> which it balances in air density of 1.2 kg/m<sup>3</sup>. The As Found will equal the As Left Conventional Mass Correction if the mass(es) did not require adjustment, repair or replacement.

*(continued on next page)*

Page 7 of 7 Pages  
Weight

NAME AND ADDRESS OF CUSTOMER

Certificate Number 01076160A-1  
Date of Calibration 22-MAY-2019

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Inter-Mountain Laboratories  
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## SECTION 12: DEFINITIONS AND TERMS (continued)

**UNCERTAINTY** - Non-negative parameter characterizing the dispersion of the quantity values being attributed to a measurand, based on the information used. The uncertainty is calculated in accordance with NIST TechNote 1297 using a coverage factor of  $k = 2$  ( $k = 2$  defines an interval having a level of confidence of approximately 95 percent). The uncertainty does not include possible effects of magnetism.

**TOLERANCE** - Defines the limits in which the correction value and the uncertainty must fall to meet the tolerance specification for the given Class.

**AS FOUND CONVENTIONAL MASS VALUE** - The measured value of the mass(es) as they were received by Troemner, of weighing in air in accordance to International Recommendation OIML D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of density 8000 kg/m<sup>3</sup> which it balances in air density of 1.2 kg/m<sup>3</sup>. If the customer requires cleaning prior to calibration, the after cleaning value would be reported.

**AS LEFT CONVENTIONAL MASS VALUE** - The measured value of the mass(es) after they were adjusted, repaired or replaced when necessary, of weighing in air in accordance to International Recommendation OIML D 28. For a weight taken at 20 °C, the Conventional Mass is the mass of a reference weight of density 8000 kg/m<sup>3</sup> which it balances in air density of 1.2 kg/m<sup>3</sup>. The As Found will equal the As Left Conventional Mass Value if the mass(es) did not require adjustment, repair or replacement.

**ASTM E617** - Weights meet the tolerance specification for ASTM E617. Weights 2kg - 1g screened for magnetism using a Gaussmeter.

## SECTION 13: ADDENDUM

Weight found out of tolerance and replaced.

# ISO/IEC 17025 Calibration Certificate



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Page 1 of 7 Pages  
Weight

## SECTION 1: NAME AND ADDRESS OF CUSTOMER

Certificate Number 01108062-1  
Date of Calibration 05-DEC-2019

### End user

Inter Mountain Laboratories  
555 Absaraka Street  
Air Science  
Sheridan WY 82801

### Client

Inter-Mountain Laboratories  
PO BOX 4006  
Sheridan WY 82801-0661

## SECTION 2: APPROVED SIGNATORY

  
Annemarie Love, Metrologist

## SECTION 3: PERSON PERFORMING WORK

Robotic Calibration

## SECTION 4: CERTIFICATE INFORMATION

Description of Masses: Analytical Weight

Accuracy Class	: Troemner Ultra Class *	Date Received	: 26-NOV-2019
Order Number	: 247181	Date of Calibration	: 05-DEC-2019
Construction	: One Piece	Date of Issue	: 10-DEC-2019
Material	: Stainless Steel	Weight Range	: 200mg

## SECTION 5: ENVIRONMENTAL CONDITIONS DURING TEST

Temperature: 21.63 °C      Pressure: 751.14 mm Hg      Relative Humidity: 48%

## SECTION 6: PERTINENT INFORMATION

The Weights listed on this calibration report have been compared to reference mass standards that are traceable to the SI through the National Institute of Standards and Technology under Test No. 684/289871-17.

Reference standards and balances used to perform the calibration are listed in Section 10.

The weights calibrated for this report have been calibrated in accordance with Troemner's calibration process. The calibration performed meets the criteria as described in the current revisions of ASTM E617 and OIML R111.

This calibration also meets specifications as outlined in ISO/IEC 17025, ANSI/NCSL Z540-1-1994, and applicable documents.

\* Troemner's Ultra Class is an enhanced group of weight tolerances which are equal to ASTM E617 Class 0

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Weight

NAME AND ADDRESS OF CUSTOMER

Certificate Number 01108062-1  
Date of Calibration 05-DEC-2019

End user

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555 Absaraka Street  
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Client

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PO BOX 4006  
Sheridan WY 82801-0661

SECTION 7: TRUE MASS (MASS IN VACUUM) CALIBRATION DATA

Nominal Mass Value	Serial Number	True Mass		Density † of Weight	Uncertainty ( + or - )
		As Found	As Left		
200 mg	6578	0.1999982 g	0.1999982 g	7.9500 g/cm <sup>3</sup>	0.0012 mg

† Density is assumed unless otherwise stated

‡ As Found / † Total

# ISO/IEC 17025 Calibration Certificate



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Page 3 of 7 Pages  
 Weight

**NAME AND ADDRESS OF CUSTOMER**

Certificate Number 01108062-1  
 Date of Calibration 05-DEC-2019

End user  
 Inter Mountain Laboratories  
 555 Absaraka Street  
 Air Science  
 Sheridan WY 82801

Client  
 Inter-Mountain Laboratories  
 PO BOX 4006  
 Sheridan WY 82801-0661

**SECTION 8: CONVENTIONAL MASS CALIBRATION VALUE VS. REFERENCE DENSITY 8000 kg/m<sup>3</sup>**

Nominal Mass Value	Serial Notes	Serial Number	--- Conventional Mass Value ---		Uncertainty ( + or - )	Tolerance <sup>u</sup> ( + or - )
			As Found	As Left		
200 mg		6578	0.1999980 g	0.1999980 g	0.0012 mg	0.0050 mg

# ISO/IEC 17025 Calibration Certificate



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Page 4 of 7 Pages  
Weight

NAME AND ADDRESS OF CUSTOMER

Certificate Number 01108062-1  
Date of Calibration 05-DEC-2019

End user  
Inter Mountain Laboratories  
555 Absaraka Street  
Air Science  
Sheridan WY 82801

Client  
Inter-Mountain Laboratories  
PO BOX 4006  
Sheridan WY 82801-0661

SECTION 9: CONVENTIONAL MASS CALIBRATION DATA VS. REFERENCE DENSITY 8000 kg/m<sup>3</sup>

Nominal Mass Value	Notes	Serial Number	-- Conventional Mass Correction --		Uncertainty ( + or - )	Tolerance <sup>u</sup> ( + or - )
			As Found	As Left		
200 mg		6578	-0.0020 mg	-0.0020 mg	0.0012 mg	0.0050 mg



# ISO/IEC 17025 Calibration Certificate



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Page 5 of 7 Pages  
Weight

NAME AND ADDRESS OF CUSTOMER

Certificate Number 01108062-1  
Date of Calibration 05-DEC-2019

End user

Inter Mountain Laboratories  
555 Absaraka Street  
Air Science  
Sheridan WY 82801

Client

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PO BOX 4006  
Sheridan WY 82801-0661

## SECTION 10: CALIBRATION PROCEDURE DATA

Nominal Mass Value	Serial Number	Standard Set No.	Cal Due	Balance Used	Cal Due	Procedure Used
200 mg	6578	A031	07/01/20	A5XL-131	01/01/20	Multi A-B

Page 6 of 7 Pages  
Weight

NAME AND ADDRESS OF CUSTOMER

Certificate Number 01108062-1  
Date of Calibration 05-DEC-2019

End user  
Inter Mountain Laboratories  
555 Absaraka Street  
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Sheridan WY 82801

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PO BOX 4006  
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## SECTION 11: GENERAL INFORMATION

This calibration was performed in Troemner's High Precision Level I Mass Metrology Laboratory at 201 Wolf Drive, Thorofare, New Jersey 08086 unless otherwise noted on the Addendum. The internal procedures used are CAL-CLASSI and METR-MAP.

## SECTION 12: DEFINITIONS AND TERMS

**TRUE MASS** - The mass of a weight as if it were measured in a vacuum. Also known as Mass in a Vacuum.

**CONVENTIONAL MASS** - The conventional value of the result of weighing in air in accordance to International Recommendation OIML D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of a density of 8000 kg/m<sup>3</sup> which it balances in air of a density of 1.2 kg/m<sup>3</sup>.

**AS FOUND TRUE MASS** - The measured value of the mass(es) as they were received by Troemner.

**AS LEFT TRUE MASS** - The measured value of the mass(es) after adjustment, repair, or replacement when necessary. The As Found True Mass will equal the As Left True Mass if the mass(es) did not require adjustment, repair or replacement.

**NOMINAL MASS** - The mass value as marked on the weight.

**CORRECTION** - The difference between the conventional mass value of a weight and its nominal value. A positive correction indicates that the conventional mass value is greater than the nominal value by the amount of the correction.

**AS FOUND CONVENTIONAL MASS CORRECTION** - The conventional correction of the result, as it was received by Troemner, of weighing in air in accordance to International Recommendation D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of density 8000 kg/m<sup>3</sup>, which it balances in air density of 1.2 kg/m<sup>3</sup>. If the customer requires cleaning prior to calibration, the after cleaning correction would be reported.

**AS LEFT CONVENTIONAL MASS CORRECTION** - The conventional correction of the result, after adjustment, repair, or replacement of weighing in air in accordance to International Recommendation D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of density 8000 kg/m<sup>3</sup> which it balances in air density of 1.2 kg/m<sup>3</sup>. The As Found will equal the As Left Conventional Mass Correction if the mass(es) did not require adjustment, repair or replacement.

*(continued on next page)*

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Weight

NAME AND ADDRESS OF CUSTOMER

Certificate Number 01108062-1  
Date of Calibration 05-DEC-2019

End user

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Client

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PO BOX 4006  
Sheridan WY 82801-0661

**SECTION 12: DEFINITIONS AND TERMS (continued)**

**UNCERTAINTY** - Non-negative parameter characterizing the dispersion of the quantity values being attributed to a measurand, based on the information used. The uncertainty is calculated in accordance with NIST TechNote 1297 using a coverage factor of  $k = 2$  ( $k = 2$  defines an interval having a level of confidence of approximately 95 percent). The uncertainty does not include possible effects of magnetism.

**TOLERANCE** - Defines the limits in which the correction value and the uncertainty must fall to meet the tolerance specification for the given Class.

**AS FOUND CONVENTIONAL MASS VALUE** - The measured value of the mass(es) as they were received by Troemner, of weighing in air in accordance to International Recommendation OIML D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of density 8000 kg/m<sup>3</sup> which it balances in air density of 1.2 kg/m<sup>3</sup>. If the customer requires cleaning prior to calibration, the after cleaning value would be reported.

**AS LEFT CONVENTIONAL MASS VALUE** - The measured value of the mass(es) after they were adjusted, repaired or replaced when necessary, of weighing in air in accordance to International Recommendation OIML D 28. For a weight taken at 20 °C, the Conventional Mass is the mass of a reference weight of density 8000 kg/m<sup>3</sup> which it balances in air density of 1.2 kg/m<sup>3</sup>. The As Found will equal the As Left Conventional Mass Value if the mass(es) did not require adjustment, repair or replacement.

**ASTM E617** - Weights meet the tolerance specification for ASTM E617. Weights 2kg - 1g screened for magnetism using a Gaussmeter.

# ISO/IEC 17025 Calibration Certificate



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Page 1 of 7 Pages  
Weight

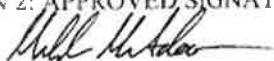
## SECTION 1: NAME AND ADDRESS OF CUSTOMER

Certificate Number 01131061-1  
Date of Calibration 18-Mar-2020

End user  
Inter Mountain Laboratories  
555 Absaraka Street  
Air Science  
Sheridan WY 82801

Client  
Inter-Mountain Laboratories  
PO BOX 4006  
Sheridan WY 82801-0661

## SECTION 2: APPROVED SIGNATORY

  
Mekayla McAdoo, Metrologist

## SECTION 3: PERSON PERFORMING WORK

Robotic Calibrator

## SECTION 4: CERTIFICATE INFORMATION

Description of Masses: Analytical Weight

Accuracy Class	: Troemner Ultra Class *	Date Received	: 17-Mar-2020
Order Number	: C2020031601JLC	Date of Calibration	: 18-Mar-2020
Construction	: One Piece	Date of Issue	: 18-Mar-2020
Material	: Stainless Steel	Weight Range	: 500 mg

## SECTION 5: ENVIRONMENTAL CONDITIONS DURING TEST

Temperature: 21.46 °C      Pressure: 773.34 mm Hg      Relative Humidity: 48%

## SECTION 6: PERTINENT INFORMATION

The Weights listed on this calibration report have been compared to reference mass standards that are traceable to the SI through the National Institute of Standards and Technology under Test No. 684/289871-17.

Reference standards and balances used to perform the calibration are listed in Section 10.

The weights calibrated for this report have been calibrated in accordance with Troemner's calibration process. The calibration performed meets the criteria as described in the current revisions of ASTM E617 and OIML R111.

This calibration also meets specifications as outlined in ISO/IEC 17025, ANSI/NCCL Z540-1-1994, and applicable documents.

\* Troemner's Ultra Class is an enhanced group of weight tolerances which are equal to ASTM E617 Class D

# ISO/IEC 17025 Calibration Certificate



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Weight

NAME AND ADDRESS OF CUSTOMER

Certificate Number 01131061-1  
Date of Calibration 18-Mar-2020

End user  
Inter Mountain Laboratories  
555 Absaraka Street  
Air Science  
Sheridan WY 82801

Client  
Inter-Mountain Laboratories  
PO BOX 4006  
Sheridan WY 82801-0661

## SECTION 7: TRUE MASS (MASS IN VACUUM) CALIBRATION DATA

Nominal Mass Value	Serial Number	True Mass	Density <sup>1</sup> of Weight	Uncertainty (+ or -)
500 mg	1000188167	0.5000015 g	7.9500 g/cm <sup>3</sup>	0.0012 mg

<sup>1</sup> Density is assumed unless otherwise stated

# ISO/IEC 17025 Calibration Certificate



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Weight

NAME AND ADDRESS OF CUSTOMER

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Date of Calibration 18-Mar-2020

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Sheridan WY 82801-0661

## SECTION 8: CONVENTIONAL MASS CALIBRATION VALUE VS. REFERENCE DENSITY 8000 kg/m<sup>3</sup>

Nominal Mass Value	Serial Number	Conventional Mass Value	Uncertainty (+ or -)	Tolerance <sup>u</sup> (+ or -)
500 mg	1000188167	0.5000010 g	0.0012 mg	0.0050 mg

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NAME AND ADDRESS OF CUSTOMER

Certificate Number 01131061-1  
Date of Calibration 18-Mar-2020

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Sheridan WY 82801-0661

SECTION 9: CONVENTIONAL MASS CALIBRATION DATA VS. REFERENCE DENSITY 8000 kg/m<sup>3</sup>

Nominal Mass Value	Serial Number	Conventional Mass Correction	Uncertainty (+ or -)	Tolerance <sup>u</sup> (+ or -)
500 mg	1000188167	0.0010 mg	0.0012 mg	0.0050 mg

# ISO/IEC 17025 Calibration Certificate



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NAME AND ADDRESS OF CUSTOMER

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SECTION 10: CALIBRATION PROCEDURE DATA

Nominal Mass Value	Serial Number	Standard Set No.	Cal Due	Balance Used	Cal Due	Procedure Used
500 mg	1000188167	A031	01-Jul-2020	A5XL-131	01-Jan-2021	Multi A-B



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Weight

NAME AND ADDRESS OF CUSTOMER

Certificate Number 01131061-1  
Date of Calibration 18-Mar-2020

End user  
Inter Mountain Laboratories  
555 Absaraka Street  
Air Science  
Sheridan WY 82801

Client  
Inter-Mountain Laboratories  
PO BOX 4006  
Sheridan WY 82801-0661

## SECTION 11: GENERAL INFORMATION

This calibration was performed in Troemner's High Precision Level I Mass Metrology Laboratory at 201 Wolf Drive, Thorofare, New Jersey 08086 unless otherwise noted on the Addendum. The internal procedures used are CAL-CLASSI and METR-MAP.

## SECTION 12: DEFINITIONS AND TERMS

**TRUE MASS** - The mass of a weight as if it were measured in a vacuum. Also known as Mass in a Vacuum.

**CONVENTIONAL MASS** - The conventional value of the result of weighing in air in accordance to International Recommendation OIML D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of a density of 8000 kg/m<sup>3</sup> which it balances in air of a density of 1.2 kg/m<sup>3</sup>.

**AS FOUND TRUE MASS** - The measured value of the mass(es) as they were received by Troemner.

**AS LEFT TRUE MASS** - The measured value of the mass(es) after adjustment, repair, or replacement when necessary. The As Found True Mass will equal the As Left True Mass if the mass(es) did not require adjustment, repair or replacement.

**NOMINAL MASS** - The mass value as marked on the weight.

**CORRECTION** - The difference between the conventional mass value of a weight and its nominal value. A positive correction indicates that the conventional mass value is greater than the nominal value by the amount of the correction.

**AS FOUND CONVENTIONAL MASS CORRECTION** - The conventional correction of the result, as it was received by Troemner, of weighing in air in accordance to International Recommendation D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of density 8000 kg/m<sup>3</sup> which it balances in air density of 1.2 kg/m<sup>3</sup>. If the customer requires cleaning prior to calibration, the after cleaning correction would be reported.

**AS LEFT CONVENTIONAL MASS CORRECTION** - The conventional correction of the result, after adjustment, repair, or replacement of weighing in air in accordance to International Recommendation D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of density 8000 kg/m<sup>3</sup> which it balances in air density of 1.2 kg/m<sup>3</sup>. The As Found will equal the As Left Conventional Mass Correction if the mass(es) did not require adjustment, repair or replacement.

*(continued on next page)*

Page 7 of 7 Pages  
WeightNAME AND ADDRESS OF CUSTOMER  
Certificate Number 01131061-1  
Date of Calibration 18-Mar-2020End user  
Inter Mountain Laboratories  
555 Absaraka Street  
Air Science  
Sheridan WY 82801Client  
Inter-Mountain Laboratories  
PO BOX 4006  
Sheridan WY 82801-0661

## SECTION 12: DEFINITIONS AND TERMS (continued)

**UNCERTAINTY** - Non-negative parameter characterizing the dispersion of the quantity values being attributed to a measurand, based on the information used. The uncertainty is calculated in accordance with NIST TechNote 1297 using a coverage factor of  $k = 2$  ( $k = 2$  defines an interval having a level of confidence of approximately 95 percent). The uncertainty does not include possible effects of magnetism.

**TOLERANCE** - Defines the limits in which the correction value and the uncertainty must fall to meet the tolerance specification for the given Class.

**AS FOUND CONVENTIONAL MASS VALUE** - The measured value of the mass(es) as they were received by Troemner, of weighing in air in accordance to International Recommendation OIML D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of density 8000 kg/m<sup>3</sup> which it balances in air density of 1.2 kg/m<sup>3</sup>. If the customer requires cleaning prior to calibration, the after cleaning value would be reported.

**AS LEFT CONVENTIONAL MASS VALUE** - The measured value of the mass(es) after they were adjusted, repaired or replaced when necessary, of weighing in air in accordance to International Recommendation OIML D 28. For a weight taken at 20 °C, the Conventional Mass is the mass of a reference weight of density 8000 kg/m<sup>3</sup> which it balances in air density of 1.2 kg/m<sup>3</sup>. The As Found will equal the As Left Conventional Mass Value if the mass(es) did not require adjustment, repair or replacement.

**ASTM E617** - Weights meet the tolerance specification for ASTM E617. Weights 2kg - 1g screened for magnetism using a Gaussmeter.



# Texas Commission on Environmental Quality



## NELAP - Recognized Laboratory Fields of Accreditation

Pace Analytical Services, LLC - Sheridan, WY  
1673 Terra Avenue  
Sheridan, WY 82801-6116

Certificate: T104704507-20-13  
Expiration Date: 1/31/2021  
Issue Date: 2/1/2020

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

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### Matrix: *Air & Emissions*

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Method 40 CFR Part 50 Appendix B

**Analyte**

Total Suspended Particulate

AB  
TX

**Analyte ID**  
3973

**Method ID**  
10000304

Method 40 CFR Part 50 Appendix J

**Analyte**

Particulates <10 um

AB  
TX

**Analyte ID**  
3950

**Method ID**  
10000507

Method 40 CFR Part 50 Appendix L

**Analyte**

Fine particulates <2.5 um

AB  
TX

**Analyte ID**  
3805

**Method ID**  
40 CFR 50 App L

Method EPA EQL-0310-189

**Analyte**

Lead

AB  
TX

**Analyte ID**  
1075

**Method ID**  
10245622



# Texas Commission on Environmental Quality



NELAP-Recognized Laboratory Accreditation is hereby awarded to

**Inter-Mountain Laboratories, Inc.**  
1673 Terra Avenue  
Sheridan, WY 82801-6116

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses ([www.tceq.texas.gov/goto/lab](http://www.tceq.texas.gov/goto/lab)). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

Certificate Number: T104704507-19-12  
Effective Date: 7/24/2019  
Expiration Date: 1/31/2020

A handwritten signature in black ink, appearing to read "T. B. Baker".

Executive Director Texas Commission on  
Environmental Quality



# Texas Commission on Environmental Quality



NELAP-Recognized Laboratory Accreditation is hereby awarded to

**Inter-Mountain Laboratories, Inc.**  
1673 Terra Avenue  
Sheridan, WY 82801-6116

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses ([www.tceq.texas.gov/goto/lab](http://www.tceq.texas.gov/goto/lab)). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

A handwritten signature in black ink, appearing to read "T. B. Baker", written over a horizontal line.

Certificate Number: T104704507-19-11  
Effective Date: 2/1/2019  
Expiration Date: 1/31/2020

Executive Director Texas Commission on  
Environmental Quality



ARIZONA DEPARTMENT  
OF HEALTH SERVICES

## ENVIRONMENTAL LABORATORY LICENSE

### Issued to:


Laboratory Director: Tom Patten  
Owner/Representative: Kevin Chartier

*Inter-Mountain Laboratories, Inc.*  
*AZ0773*

is in compliance with Environmental Laboratory's applicable standards for the State of Arizona and maintains on file a List of Parameters for which the laboratory is certified to perform analysis.

**PERIOD OF LICENSURE FROM: 12/05/2018 TO: 12/05/2019**



  
Steven D. Baker, Chief  
Office of Laboratory Licensure & Certification  
Bureau of State Laboratory Services



# ENVIRONMENTAL LABORATORY LICENSE

Issued to:

Laboratory Director: Tim Mendenhall  
Owner/Representative: Kevin Chartier

*Pace Analytical Services, LLC.*  
*AZ0773*

is in compliance with Environmental Laboratory's applicable standards for the State of Arizona and maintains on file a List of Parameters for which the laboratory is certified to perform analysis.

**PERIOD OF LICENSURE FROM: 12/05/2019 TO: 12/05/2020**



A handwritten signature in black ink, likely belonging to Steven D. Baker.

Steven D. Baker, Chief  
Office of Laboratory Licensure & Certification  
Bureau of State Laboratory Services