

Certificate of Mass Calibration

Metrology Laboratory
 Bureau of Weights and Measures
 2801 North Cooke Street
 Helena, MT 59601
 Phone: (406) 449-2582



Company Name and Address

Lance Waller
 Montana-Dakota Scale Service
 Route 1, Box 1640
 Fairview, MT 59221
 (406) 742-5944

Test Number

2020-045

Artifacts Arrived: 4/20/2020
 Test Date: 4/20/2020
 Expiration Date: 4/20/2022

Environmental Conditions at Time of Test:

Temperature °C		Pressure mmHg	Relative Humidity %	
Start	End	Duration of Test	Start	End
25.1	25.6	668.78	49.8	50.5

Standards and Procedures used for testing:

The Standards used for this comparison are continuously monitored by a measurement control program for ensuring continued accuracy and traceability within the level of uncertainty reported. These standards were calibrated by a nationally accredited and are traceable to the SI. The test number listed above is traceable to National Standards through an unbroken chain of comparison each having stated uncertainties. This information is on file and available upon request.

Uncertainty Statement:

The combined standard uncertainty includes the uncertainty reported for the standard(s), the uncertainty associated with the measurement process, the uncertainty associated with the allowable sensitivity error, the uncertainty associated with the allowable drift error, the uncertainty associated with drift of the standard over time, and the uncertainty associated with the uncorrected magnitude of air buoyancy. No other uncertainty components were included. The combined standard uncertainty is multiplied by a coverage factor (k) to yield an expanded uncertainty, which defines an interval having a level of confidence of approximately 95 percent. The expanded uncertainty presented in this report is consistent with the JCGM 100:2008 Guide to the Expression of Uncertainty in Measurement (GUM) and follows NISTIR 6969, SOP29, 2014. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Evidence of Metrological Traceability:

The measurements used for determining the results appearing in this report have metrological traceability to the National Institute of Standards and Technology (NIST), as supported by calibration data on file. Further, the measurements were found to be in control as evidenced by the data collected during the measurement assurance process established for this procedure. This process is part of a comprehensive measurement assurance program for ensuring continued accuracy and metrological traceability within the level of uncertainty reported by this laboratory.

Note:

Conversion factors for metrological traceability to the International System of Units (SI) are from NIST Special Publication 811: 2008 Edition "Guide for the Use of the International System of Units (SI)".

To Convert From:	To:	Multiply By:
Pound (avoirdupois) (lb)	Kilogram (kg)	4.535924 E-01

Condition of Artifacts:

Cart and weights have been freshly painted and are in good condition.

T E S T R E S U L T S

Procedure Used:

NISTIR 6969, SOP 7

Nominal	Serial No.	Conventional Mass Correction		Uncertainty (g) (~95% Confidence)	Tolerance ± (g)	K Factor
		As Found (g)	As Left (g)			
2500 lb	CART	1805	102	65	395	2.04
2500 lb	1	-98	-98	38	110	2.04
2500 lb	2	35	35	38	110	2.04
2500 lb	3	96	96	38	110	2.04

Test Number 2020-045

General Conditions/Notes:

- ① The State of Montana Metrology Laboratory complies with the requirements of NIST Handbook 143, April 2007 for Echelon III Mass testing.
- ② The laboratory is maintained with-in established limits for the Standard Operating Procedure (SOP) specified on this report. Tests are not conducted when conditions deviate from those specified.
- ③ The data in this report only applies to the items specifically listed on this report.
- ④ This report may not be reproduced, except in full, without the written approval of the State of Montana Metrology Laboratory.
- ⑤ This report may not be used to claim endorsement by NIST or any agency of the U.S. Government.
- ⑥ Any declaration of expiration is at the written request of the device owner.

David Fraser

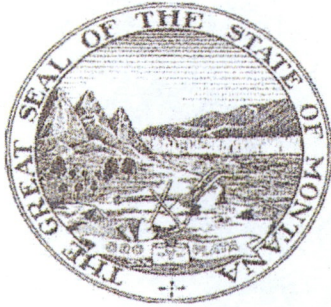
State Metrologist

4/20/2020

Date

END OF REPORT

2020-045



Certificate of Mass Calibration

Metrology Laboratory
 Bureau of Weights and Measures
 2801 North Cooke Street
 Helena, MT 59601
 Phone: (406) 449-2582

Company Name and Address

Lance Waller
 Montana-Dakota Scale Service
 Route 1, Box 1640
 Fairview, MT 59221
 (406) 742-5944

Test Number

2020-056

Artifacts Arrived: 6/4/2020
 Test Date: 6/4/2020
 Expiration Date: 6/4/2021

Environmental Conditions at Time of Test:

Temperature °C		Pressure mmHg	Relative Humidity %	
Start	End	Duration of Test	Start	End
23.5	23.9	668.3	51.3	51.8

Standards and Procedures used for testing:

The Standards used for this comparison are continuously monitored by a measurement control program for ensuring continued accuracy and traceability within the level of uncertainty reported. These standards were calibrated by a nationally accredited laboratory (Reports on File) and are traceable to the SI. The test number listed above is traceable to National Standards through an unbroken chain of comparison each having stated uncertainties. This information is on file and available upon request.

Uncertainty Statement:

The combined standard uncertainty includes the uncertainty reported for the standard(s), the uncertainty associated with the measurement process, the uncertainty associated with the allowable sensitivity error, the uncertainty associated with the allowable drift error, the uncertainty associated with drift of the standard over time, and the uncertainty associated with the uncorrected magnitude of air buoyancy. No other uncertainty components were included. The combined standard uncertainty is multiplied by a coverage factor (k) to yield an expanded uncertainty, which defines an interval having a level of confidence of approximately 95 percent. The expanded uncertainty presented in this report is consistent with the JCGM 100:2008 Guide to the Expression of Uncertainty in Measurement (GUM) and follows NISTIR 6969, SOP29, 2014. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Evidence of Metrological Traceability:

The measurements used for determining the results appearing in this report have metrological traceability to the National Institute of Standards and Technology (NIST), as supported by calibration data on file. Further, the measurements were found to be in control as evidenced by the data collected during the measurement assurance process established for this procedure. This process is part of a comprehensive measurement assurance program for ensuring continued accuracy and metrological traceability within the level of uncertainty reported by this laboratory.

Note:

Conversion factors for metrological traceability to the International System of Units (SI) are from NIST Special Publication 811: 2008 Edition "Guide for the Use of the International System of Units (SI)".

To Convert From:
 Pound (avoirdupois) (lb)

To:
 Kilogram (kg)

Multiply By:
 4.535924 E-01

- ② The laboratory is maintained with-in established limits for the Standard Operating Procedure (SOP) specified on this report. Tests are not conducted when conditions deviate from those specified.
- ③ The data in this report only applies to the items specifically listed on this report.
- ④ This report may not be reproduced, except in full, without the written approval of the State of Montana Metrology Laboratory.
- ⑤ This report may not be used to claim endorsement by NIST or any agency of the U.S. Government.
- ⑥ Any declaration of expiration is at the written request of the device owner.

David Fraser

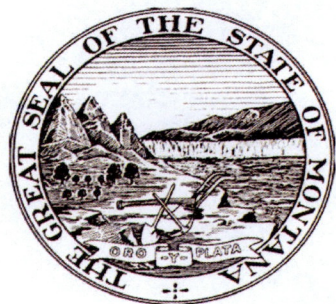
State Metrologist

6/4/2020

Date

END OF REPORT

2020-056



Certificate of Mass Calibration

Metrology Laboratory
 Bureau of Weights and Measures
 2801 North Cooke Street
 Helena, MT 59601
 Phone: (406) 449-2582

Company Name and Address

Lance Waller
Montana-Dakota Scale Service
Route 1, Box 1640
Fairview, MT 59221
(406) 742-5944

Test Number

2020-046

Artifacts Arrived:	4/20/2020
Test Date:	4/29/2020
Expiration Date:	4/29/2022

Environmental Conditions at Time of Test:

Temperature °C		Pressure mmHg	Relative Humidity %	
Start	End	Duration of Test	Start	End
26.2	26.8	668.78	51.8	51.9

Standards and Procedures used for testing:

The Standards used for this comparison are continuously monitored by a measurement control program for ensuring continued accuracy and traceability within the level of uncertainty reported. These standards were calibrated by a nationally accredited laboratory and are traceable to the SI. The test number listed above is traceable to National Standards through an unbroken chain of comparison each having stated uncertainties. This information is on file and available upon request.

Uncertainty Statement:

The combined standard uncertainty includes the uncertainty reported for the standard(s), the uncertainty associated with the measurement process, the uncertainty associated with the allowable sensitivity error, the uncertainty associated with the allowable drift error, the uncertainty associated with drift of the standard over time, and the uncertainty associated with the uncorrected magnitude of air buoyancy. No other uncertainty components were included. The combined standard uncertainty is multiplied by a coverage factor (k) to yield an expanded uncertainty, which defines an interval having a level of confidence of approximately 95 percent. The expanded uncertainty presented in this report is consistent with the JCGM 100:2008 Guide to the Expression of Uncertainty in Measurement (GUM) and follows NISTIR 6969, SOP29, 2014. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Evidence of Metrological Traceability:

The measurements used for determining the results appearing in this report have metrological traceability to the National Institute of Standards and Technology (NIST), as supported by calibration data on file. Further, the measurements were found to be in control as evidenced by the data collected during the measurement assurance process established for this procedure. This process is part of a comprehensive measurement assurance program for ensuring continued accuracy and metrological traceability within the level of uncertainty reported by this laboratory.

Note:

Conversion factors for metrological traceability to the International System of Units (SI) are from NIST Special Publication 811: 2008 Edition "Guide for the Use of the International System of Units (SI)".

To Convert From :
 Pound (avoirdupois) (lb)

To:
 Kilogram (kg)

Multiply By:
 4.535924 E-01

General Conditions/Notes:

- ① The State of Montana Metrology Laboratory complies with the requirements of NIST Handbook 143, April 2007 for Echelon III Mass testing.
- ② The laboratory is maintained with-in established limits for the Standard Operating Procedure (SOP) specified on this report. Tests are not conducted when conditions deviate from those specified.
- ③ The data in this report only applies to the items specifically listed on this report.
- ④ This report may not be reproduced, except in full, without the written approval of the State of Montana Metrology Laboratory.
- ⑤ This report may not be used to claim endorsement by NIST or any agency of the U.S. Government.
- ⑥ Any declaration of expiration is at the written request of the device owner.

David Fraser

State Metrologist

4/29/2020

Date

END OF REPORT

2020-046



Certificate of Mass Calibration

Metrology Laboratory
 Bureau of Weights and Measures
 2801 North Cooke Street
 Helena, MT 59601
 Phone: (406) 449-2582

Company Name and Address

Lance Waller
 Montana-Dakota Scale Service
 Route 1, Box 1640
 Fairview, MT 59221
 (406) 742-5944

Test Number

2020-049

Artifacts Arrived: 4/24/2020

Test Date: 5/1/2020

Expiration Date:

5/1/2021

Environmental Conditions at Time of Test:

Temperature °C		Pressure mmHg	Relative Humidity %	
Start	End	Duration of Test	Start	End
22.1	22.6	668.8	50.8	50.9

Standards and Procedures used for testing:

The Standards used for this comparison are continuously monitored by a measurement control program for ensuring continued accuracy and traceability within the level of uncertainty reported. These standards were calibrated by a nationally accredited laboratory (Reports on File) and are traceable to the SI. The test number listed above is traceable to National Standards through an unbroken chain of comparison each having stated uncertainties. This information is on file and available upon request.

Uncertainty Statement:

The combined standard uncertainty includes the uncertainty reported for the standard(s), the uncertainty associated with the measurement process, the uncertainty associated with the allowable sensitivity error, the uncertainty associated with the allowable drift error, the uncertainty associated with drift of the standard over time, and the uncertainty associated with the uncorrected magnitude of air buoyancy. No other uncertainty components were included. The combined standard uncertainty is multiplied by a coverage factor (k) to yield an expanded uncertainty, which defines an interval having a level of confidence of approximately 95 percent. The expanded uncertainty presented in this report is consistent with the JCGM 100:2008 Guide to the Expression of Uncertainty in Measurement (GUM) and follows NISTIR 6969, SOP29, 2014. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Evidence of Metrological Traceability:

The measurements used for determining the results appearing in this report have metrological traceability to the National Institute of Standards and Technology (NIST), as supported by calibration data on file. Further, the measurements were found to be in control as evidenced by the data collected during the measurement assurance process established for this procedure. This process is part of a comprehensive measurement assurance program for ensuring continued accuracy and metrological traceability within the level of uncertainty reported by this laboratory.

Note:

Conversion factors for metrological traceability to the International System of Units (SI) are from NIST Special Publication 811: 2008 Edition "Guide for the Use of the International System of Units (SI)".

To Convert From:
 Pound (avoirdupois) (lb)

To:
 Kilogram (kg)

Multiply By:
 4.535924 E-01

General Conditions/Notes:

- ① The State of Montana Metrology Laboratory complies with the requirements of NIST Handbook 143, April 2007 for Echelon III Mass testing.
- ② The laboratory is maintained with-in established limits for the Standard Operating Procedure (SOP) specified on this report. Tests are not conducted when conditions deviate from those specified.
- ③ The data in this report only applies to the items specifically listed on this report.
- ④ This report may not be reproduced, except in full, without the written approval of the State of Montana Metrology Laboratory.
- ⑤ This report may not be used to claim endorsement by NIST or any agency of the U.S. Government.
- ⑥ Any declaration of expiration is at the written request of the device owner.

David Fraser

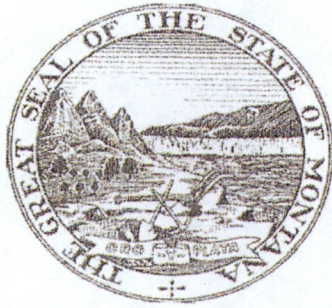
State Metrologist

5/1/2020

Date

END OF REPORT

2020-049



Certificate of Mass Calibration

Metrology Laboratory
 Bureau of Weights and Measures
 2801 North Cooke Street
 Helena, MT 59601
 Phone: (406) 449-2582

Company Name and Address

Lance Waller
Montana-Dakota Scale Service
Route 1, Box 1640
Fairview, MT 59221
(406) 742-5944

Test Number

2020-050

Artifacts Arrived:	4/24/2020
Test Date:	5/1/2020
Expiration Date:	5/1/2021

Environmental Conditions at Time of Test:

Temperature °C		Pressure mmHg	Relative Humidity %	
Start	End	Duration of Test	Start	End
22.1	22.6	668.8	50.8	50.9

Standards and Procedures used for testing:

The Standards used for this comparison are continuously monitored by a measurement control program for ensuring continued accuracy and traceability within the level of uncertainty reported. These standards were calibrated by a nationally accredited laboratory on 10/2009 (Reports on File) and are traceable to the SI. The test number listed above is traceable to National Standards through an unbroken chain of comparison each having stated uncertainties. This information is on file and available upon request.

Uncertainty Statement:

The combined standard uncertainty includes the uncertainty reported for the standard(s), the uncertainty associated with the measurement process, the uncertainty associated with the allowable sensitivity error, the uncertainty associated with the allowable drift error, the uncertainty associated with drift of the standard over time, and the uncertainty associated with the uncorrected magnitude of air buoyancy. No other uncertainty components were included. The combined standard uncertainty is multiplied by a coverage factor (k) to yield an expanded uncertainty, which defines an interval having a level of confidence of approximately 95 percent. The expanded uncertainty presented in this report is consistent with the JCGM 100:2008 Guide to the Expression of Uncertainty in Measurement (GUM) and follows NISTIR 6969, SOP29, 2014. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Evidence of Metrological Traceability:

The measurements used for determining the results appearing in this report have metrological traceability to the National Institute of Standards and Technology (NIST), as supported by calibration data on file. Further, the measurements were found to be in control as evidenced by the data collected during the measurement assurance process established for this procedure. This process is part of a comprehensive measurement assurance program for ensuring continued accuracy and metrological traceability within the level of uncertainty reported by this laboratory.

Note:

Conversion factors for metrological traceability to the International System of Units (SI) are from NIST Special Publication 811: 2008 Edition "Guide for the Use of the International System of Units (SI)".

To Convert From :	To:	Multiply By:
Pound (avoirdupois) (lb)	Kilogram (kg)	4.535924 E-01

General Conditions/Notes:

- ① The State of Montana Metrology Laboratory complies with the requirements of NIST Handbook 143, April 2007 for Echelon III Mass testing.
- ② The laboratory is maintained with-in established limits for the Standard Operating Procedure (SOP) specified on this report. Tests are not conducted when conditions deviate from those specified.
- ③ The data in this report only applies to the items specifically listed on this report.
- ④ This report may not be reproduced, except in full, without the written approval of the State of Montana Metrology Laboratory.
- ⑤ This report may not be used to claim endorsement by NIST or any agency of the U.S. Government.
- ⑥ Any declaration of expiration is at the written request of the device owner.

David Fraser

State Metrologist

5/1/2020

Date

END OF REPORT

2020-050

United States Department of Commerce

National Institute of Standards and Technology

Certificate of Metrological Traceability For:

Montana

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.



2020

Scope

Mass Echelon III

25 kg to 1 mg

3000 lb to 0.001 lb

8 oz to 0.03125 oz

Weight Carts

5000 lb to 2000 lb

Volume Transfer, II

5 gal

Handwritten signature of Douglas A. Olson in black ink.

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

Effective Dates: 2020-02-01 to 2021-02-01