



**Calibration Certificate 14844**

Missouri Department of Agriculture  
Weights, Measures & Consumer Protection Division, Metrology Laboratory  
Lab Location: 1616 Missouri Blvd., Jefferson City, MO 65109  
Mailing Address: PO Box 630 Jefferson City, MO 65102  
Email: [tom.hughes@mda.mo.gov](mailto:tom.hughes@mda.mo.gov) [kevin.hanson@mda.mo.gov](mailto:kevin.hanson@mda.mo.gov)



Certificate Expires  
September 2018

Rev(8/16)

FarmChem Corporation; 616 Madison St; Floyd, IA 50435; Phone:  
Customer Number: 708; Submission Date: 9/27/16; Calibration Date: 9/30/16

**Test Item(s) Description**

1 - weight set; Material: stainless steel; Manufacturer: Rice Lake; Serial: 5FB7; Condition: good; Range: 10 lb to 1 oz

**Method and Traceability**

The SI unit for mass is the kilogram (kg) 1 lb = 0.45359237 kg

National Institute of Standards and Technology (NIST) IR 6969 modified substitution standard operating procedure (SOP) 8 compares a standard and an unknown weight once to determine the difference. The Missouri metrology laboratory has demonstrated measurement proficiency through training and interlaboratory comparisons compliant to NIST Handbook 143 - Program Handbook for State Weights and Measures Laboratories (ISO/IEC 17025:2010): Laboratory standards used for comparison are traceable to the international system of units (SI) through NIST.

**Uncertainty**

[OIML R111](#)

[NIST SOPs](#)

[NIST Handbooks](#)

The uncertainty is the root sum square of the uncertainty of the standard, the standard deviation of the process (obtained using a check standard which characterizes balance performance), a component for balance sensitivity and drift, and an uncorrected systematic error for lack of buoyancy corrections, multiplied by a coverage factor (k)<sup>1</sup> from the Student's t distribution table according to the measurement degrees of freedom<sup>2</sup> associated with a 95.45 % confidence interval. (k) was calculated using the Excel TINV function [two tailed probability 0.0455, TINV(0.0455,df)]. Magnetism was not included in the uncertainty evaluation.

**Remarks**

Conditions During Test: Temperature 21.8 to 20.3 (°C); Barometric Pressure 750.2 to 750.1 (mmHg); Relative Humidity 43 to 42 (%)

Calibrated by: Tom Hughes

Lab Manager: *Kevin Hanson*

Date Calibrated: 9/30/16

Weights are not checked for magnetism or material hardness with this procedure. The weight surface finish was visually inspected with a Flexbar surface finish comparator and the finish is considered adequate for the tolerance class listed unless otherwise noted in the "Remarks" section. This document shall not be reproduced except in full or used to claim product endorsement by this laboratory without written approval from the Missouri Metrology Lab. The results listed in this report only apply to the items calibrated.

5 WM-16-432 Filed: 10/27/2016 Pages: 4  
Calibration report

Farmchem Corp.

NIST Handbook 105-1 Class F Tolerances For Field Standard Weights: Tables 2, 3, 4, & 5 respectively

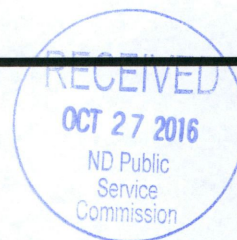
FarmChem Corporation Cert No. 14844 Serial: 5FB7

Nominal Value	Units	Standard Serial/ID	As Found Value	Value If Adjusted	± Tolerance NIST Class F	± Measurement Uncertainty	<sup>1</sup> t Table k factor	<sup>2</sup> Degrees of Freedom
10 lb			124 mg		450 mg	54 mg	2.02	124
5 lb		A	92 mg		230 mg	28 mg	2.02	124
5 lb		B	83 mg		230 mg	28 mg	2.02	124
5 lb		C	102 mg		230 mg	28 mg	2.02	124
5 lb		D	88 mg		230 mg	28 mg	2.02	124
2 lb			26 mg		91 mg	11 mg	2.02	124
1 lb		E	16.1 mg		70 mg	8.3 mg	2.02	124
1 lb			23.8 mg		70 mg	8.3 mg	2.02	124
8 oz			6.8 mg		45 mg	5.4 mg	2.02	124
4 oz			6.5 mg		23 mg	2.1 mg	2.02	124
2 oz			3.1 mg		11 mg	1.1 mg	2.02	124
1 oz			0.72 mg		5.4 mg	0.54 mg	2.02	124



**Bauske, Shelly A.**

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**From:** Daniel Ritchey <danielr@farmchem.com>  
**Sent:** Thursday, October 27, 2016 3:17 PM  
**To:** Bauske, Shelly A.  
**Subject:** RE: Calibration Report  
**Attachments:** 14844\_SOP8\_5FB7.pdf

That weight kit I show as having been assigned to Mike Coker. He now has weight kit serial 5FB7, attached is the calibration report.

Thanks,  
Dan

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**From:** Bauske, Shelly A. [<mailto:sbauske@nd.gov>]  
**Sent:** Thursday, October 27, 2016 1:17 PM  
**To:** [danielr@farmchem.com](mailto:danielr@farmchem.com)  
**Subject:** Calibration Report

Good Afternoon Daniel

The metrology for one of the weight kits (weight range 10 lb – 1 oz) on file with the Public Service Commission expired on 10/19/2016. According to the Calibration Report on file, the weight kit was certified by Missouri on October 19, 2015. Please email me the current calibration report.

Just a reminder that it is the responsibility of the registered service company to ensure its standards are certified annually by a NIST-recognized metrology laboratory and file a copy of the calibration report with the Public Service Commission.

If you have any questions, please contact me. Thank you!

Shelly Bauske  
Public Service Commission  
600 E Boulevard Ave Dept 408  
Bismarck ND 58505-0480  
701-328-4070  
701-328-2410 (fax)  
[sbauske@nd.gov](mailto:sbauske@nd.gov)

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# United States Department of Commerce

## Rational Institute of Standards and Technology

Certificate of Metrological Traceability For:

# Missouri

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 II</b>	<b>Weight Carts</b>
30 kg to 1 mg	6500 lb to 2000 lb
50 lb to 0.001 lb	Railroad Test Cars
4 oz to 0.03125 oz	110 000 lb to 80 000 lb
<b>Mass Echelon III</b>	<b>Volume Transfer, II</b>
250 kg to 1 mg	1500 gal to 5 gal
6500 lb to 0.001 lb	100 gal to 25 gal LPG
4 oz to 0.03125 oz	<b>Grain Moisture</b>
	19 % to 8 %



2016

*Carol T. Hockert*  
Carol T. Hockert, Chief  
NIST Office of Weights and Measures

Effective Dates: 2016-01-01 to 2016-12-31