



Calibration Certificate 15102

REC'D SEP 28 2017

Certificate Expires
September 2019

Missouri Department of Agriculture
Weights, Measures & Consumer Protection Division, Metrology Laboratory
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Rev(8/16)

FarmChem Corporation; 616 Madison St; Floyd, IA 50435; Phone:
Customer Number: 708; Submission Date: 9/12/17; Calibration Date: 9/15/17

Test Item(s) Description

1 - lb weight set; Material: stainless steel; Manufacturer: Rice Lake; Serial: 5YJI; 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

[NIST HB-112](#) [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)¹ from the *Student's t distribution table* according to the measurement degrees of freedom² 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.

Environmental Conditions During Test: Temperature 20.8 to 20.9 (°C); Relative Humidity 49 to 49 (%).

Calibrated by: Kevin Hanson

Lab Manager: *Kevin Hanson*

Date Calibrated: 9/15/17

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.

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

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Nominal Value	Units	Standard Serial/ID	As Found Value	Value If Adjusted	± Tolerance NIST Class F	± Measurement Uncertainty	¹ t Table k factor	² Degrees of Freedom
10 lb		●	109 mg		450 mg	57 mg	2.02	145
5 lb		4CSM ●●	51 mg		230 mg	29 mg	2.02	145
5 lb		4CSM ●●●	41 mg		230 mg	29 mg	2.02	145
5 lb		4CSM ●●●●	42 mg		230 mg	29 mg	2.02	145
5 lb		4CSM ●●●●●	30 mg		230 mg	29 mg	2.02	145
2 lb		●	18 mg		91 mg	11 mg	2.02	145
1 lb			18.8 mg		70 mg	8.6 mg	2.02	145
1 lb		●	23.9 mg		70 mg	8.6 mg	2.02	145
8 oz			14.4 mg		45 mg	5.4 mg	2.02	145
4 oz			-1.1 mg		23 mg	2.2 mg	2.02	145
2 oz			1.9 mg		11 mg	1.1 mg	2.02	145
1 oz			-0.10 mg		5.4 mg	0.55 mg	2.02	145