



Calibration Certificate

Certificate Number: 20-195

Calibration Date: 07/17/2020

Calibration Due Date: 07/17/2022

Tested Item(s): 10 lb to 0.001 lb Avdp Test Kits

Issued To: Koenig Scale Company
 4779 E. Margaret Dr.
 Terre Haute, IN 47803

POC: Kevin Koenig

Phone: 812-877-6121

Calibration Authorized By: Kevin Koenig

Date Received: 07/15/2020

Artifact(s) Description

Test Item(s): 10 lb to 0.001 lb Avdp Test Kits

Serial No: L486, KS-118, 1BD1, 1AD2, 4A, KS-802

Manufacture: Rice Lake

Material: Stainless Steel

Class Specification: NIST HB 105-1 (1990), Class F

Condition: Fair

Calibration Information

Metrologist: Howard Wickersham

Procedure: NIST SOP 8 (2015)

Temperature: 21.1 °C

Pressure: 743.2 mm Hg

Humidity: 51.9 % RH

Summary Table

Nominal Mass	Serial No. / ID	Manufacture	Correct	Adjusted	Condemned	Confiscated	Total
Various	1AD2	Rice Lake	18	0	0	0	18
Various	1BD1	Rice Lake	22	0	0	0	22
Various	1BD2	Rice Lake	22	0	0	0	22
Various	4A	Rice Lake	19	0	0	0	19
Various	KSCI Shop	Rice Lake	19	0	0	0	19
Various	L486	Rice Lake	19	0	0	0	19
Grand Total			119	0	0	0	119

Calibration Results

Nominal Mass	Serial No. / ID	Manufacture	Conventional Mass Correction		U ± (mg)	k factor	Degrees of Freedom	NIST HB 105-1 (1990), Class F MPE ± (mg)	Assumed Density (g/cm³)
			As Found (mg)	As Left (mg)					
10 lb	1AD2-Dot	Rice Lake	129	129	54	2	10733	450	7.95
10 lb	1AD2-No Dot	Rice Lake	140	140	54	2	10733	450	7.95
5 lb	L486-11	Rice Lake	51	51	28	2	10675	230	7.95
5 lb	L486-12	Rice Lake	14	14	28	2	10675	230	7.95
5 lb	L486-13	Rice Lake	33	33	28	2	10675	230	7.95
5 lb	L486-14	Rice Lake	33	33	28	2	10675	230	7.95

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Chris D. Koenig



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5 lb	L486-15	Rice Lake	53	53	28	2	10675	230	7.95
5 lb	KSCI Shop-1	Rice Lake	22	22	28	2	10675	230	7.95
5 lb	KSCI Shop-2	Rice Lake	73	73	28	2	10675	230	7.95
5 lb	KSCI Shop-3	Rice Lake	46	46	28	2	10675	230	7.95
5 lb	KSCI Shop-4	Rice Lake	53	53	28	2	10675	230	7.95
5 lb	KSCI Shop-5	Rice Lake	71	71	28	2	10675	230	7.95
5 lb	1BD1-A	Rice Lake	66	66	28	2	10675	230	7.95
5 lb	1BD1-B	Rice Lake	29	29	28	2	10675	230	7.95
5 lb	1BD1-C	Rice Lake	44	44	28	2	10675	230	7.95
5 lb	1BD1-D	Rice Lake	68	68	28	2	10675	230	7.95
5 lb	1BD1-E	Rice Lake	72	72	28	2	10675	230	7.95
5 lb	1AD2-A	Rice Lake	71	71	28	2	10675	230	7.95
5 lb	4A-41	Rice Lake	-6	-6	28	2	10675	230	7.95
5 lb	4A-42	Rice Lake	23	23	28	2	10675	230	7.95
5 lb	4A-43	Rice Lake	-32	-32	28	2	10675	230	7.95
5 lb	4A-44	Rice Lake	-6	-6	28	2	10675	230	7.95
5 lb	1BD2-A	Rice Lake	62	62	28	2	10675	230	7.95
5 lb	1BD2-B	Rice Lake	59	59	28	2	10675	230	7.95
5 lb	1BD2-C	Rice Lake	27	27	28	2	10675	230	7.95
5 lb	1BD2-D	Rice Lake	45	45	28	2	10675	230	7.95
5 lb	1BD2-E	Rice Lake	61	61	28	2	10675	230	7.95
2 lb	1AD2-Dot	Rice Lake	9	9	12	2	8432	91	7.95
2 lb	1AD2-No Dot	Rice Lake	22	22	12	2	8432	91	7.95
1 lb	L486-1	Rice Lake	22.6	22.6	9.2	2.001	3211	70	7.95
1 lb	L486-2	Rice Lake	20.6	20.6	9.2	2.001	3211	70	7.95
1 lb	L486-3	Rice Lake	31.6	31.6	9.2	2.001	3211	70	7.95
1 lb	L486-4	Rice Lake	13.6	13.6	9.2	2.001	3211	70	7.95
1 lb	L486-5	Rice Lake	24.6	24.6	9.2	2.001	3211	70	7.95
1 lb	KSCI Shop-1	Rice Lake	16.6	16.6	9.2	2.001	3211	70	7.95
1 lb	KSCI Shop-2	Rice Lake	38.6	38.6	9.2	2.001	3211	70	7.95
1 lb	KSCI Shop-3	Rice Lake	32.6	32.6	9.2	2.001	3211	70	7.95
1 lb	KSCI Shop-4	Rice Lake	32.6	32.6	9.2	2.001	3211	70	7.95
1 lb	KSCI Shop-5	Rice Lake	35.6	35.6	9.2	2.001	3211	70	7.95
1 lb	1BD1-A	Rice Lake	26.6	26.6	9.2	2.001	3211	70	7.95
1 lb	1BD1-B	Rice Lake	21.6	21.6	9.2	2.001	3211	70	7.95
1 lb	1BD1-C	Rice Lake	10.6	10.6	9.2	2.001	3211	70	7.95
1 lb	1BD1-D	Rice Lake	15.6	15.6	9.2	2.001	3211	70	7.95
1 lb	1BD1-E	Rice Lake	14.6	14.6	9.2	2.001	3211	70	7.95
1 lb	1BD2-A	Rice Lake	13.6	13.6	9.2	2.001	3211	70	7.95
1 lb	1BD2-B	Rice Lake	18.6	18.6	9.2	2.001	3211	70	7.95
1 lb	1BD2-C	Rice Lake	18.6	18.6	9.2	2.001	3211	70	7.95
1 lb	1BD2-D	Rice Lake	13.6	13.6	9.2	2.001	3211	70	7.95
1 lb	1BD2-E	Rice Lake	21.6	21.6	9.2	2.001	3211	70	7.95
1 lb	4A-5	Rice Lake	-2.4	-2.4	9.2	2.001	3211	70	7.95

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1 lb	4A-6	Rice Lake	-11.4	-11.4	9.2	2.001	3211	70	7.95
1 lb	4A-7	Rice Lake	23.6	23.6	9.2	2.001	3211	70	7.95
1 lb	4A-8	Rice Lake	-13.4	-13.4	9.2	2.001	3211	70	7.95
1 lb	4A-9	Rice Lake	-4.4	-4.4	9.2	2.001	3211	70	7.95
1 lb	1AD2-A	Rice Lake	22.6	22.6	9.2	2.001	3211	70	7.95
8 oz	L486	Rice Lake	17.6	17.6	6	2	132	45	7.95
8 oz	KSCI Shop	Rice Lake	18.6	18.6	6	2	132	45	7.95
8 oz	1BD1	Rice Lake	20.6	20.6	6	2	132	45	7.95
8 oz	1BD2	Rice Lake	18.6	18.6	6	2	132	45	7.95
8 oz	4A	Rice Lake	-17.4	-17.4	6	2	132	45	7.95
8 oz	1AD2	Rice Lake	12.6	12.6	6	2	132	45	7.95
4 oz	L486	Rice Lake	6.7	6.7	2.8	2.07	36	23	7.95
4 oz	KSCI Shop	Rice Lake	8.2	8.2	2.8	2.07	36	23	7.95
4 oz	4A	Rice Lake	4	4	2.8	2.07	36	23	7.95
0.2 lb	1BD1-Dot	Rice Lake	7	7	2.2	2	10750	18	7.95
0.2 lb	1BD1-No Dot	Rice Lake	5.5	5.5	2.2	2	10750	18	7.95
0.2 lb	1BD2-Dot	Rice Lake	3.9	3.9	2.2	2	10750	18	7.95
0.2 lb	1BD2-No Dot	Rice Lake	4.6	4.6	2.2	2	10750	18	7.95
0.2 lb	1AD2-Dot	Rice Lake	7.3	7.3	2.2	2	10750	18	7.95
0.2 lb	1AD2- No Dot	Rice Lake	7.7	7.7	2.2	2	10750	18	7.95
2 oz	L486	Rice Lake	3.8	3.8	1.3	2.05	50	11	7.95
2 oz	KSCI Shop	Rice Lake	0.5	0.5	1.3	2.05	50	11	7.95
2 oz	4A	Rice Lake	-5	-5	1.3	2.05	50	11	7.95
0.1 lb	1BD1	Rice Lake	3.3	3.3	1.1	2.025	78	9.1	7.95
0.1 lb	1BD2	Rice Lake	4.8	4.8	1.1	2.025	78	9.1	7.95
0.1 lb	1AD2	Rice Lake	3.6	3.6	1.1	2.025	78	9.1	7.95
1 oz	L486	Rice Lake	-0.39	-0.39	0.67	2.074	34	5.4	7.95
1 oz	KSCI Shop	Rice Lake	2.14	2.14	0.67	2.074	34	5.4	7.95
1 oz	4A	Rice Lake	-4.17	-4.17	0.67	2.074	34	5.4	7.95
0.05 lb	1BD1	Rice Lake	1.88	1.88	0.54	2	10739	4.5	7.95
0.05 lb	1BD2	Rice Lake	1.32	1.32	0.54	2	10739	4.5	7.95
0.05 lb	1AD2	Rice Lake	1.4	1.4	0.54	2	10739	4.5	7.95
1/2 oz	L486	Rice Lake	1.28	1.28	0.34	2.094	29	2.8	7.95
1/2 oz	KSCI Shop	Rice Lake	0.55	0.55	0.34	2.094	29	2.8	7.95
1/2 oz	4A	Rice Lake	0.76	0.76	0.34	2.094	29	2.8	7.95
0.02 lb	1BD1-Dot	Rice Lake	0.61	0.61	0.22	2	10686	1.8	7.95
0.02 lb	1BD1-No Dot	Rice Lake	0.8	0.8	0.22	2	10686	1.8	7.95
0.02 lb	1BD2 Dot	Rice Lake	0.61	0.61	0.22	2	10686	1.8	7.95
0.02 lb	1BD2 No Dot	Rice Lake	0.62	0.62	0.22	2	10686	1.8	7.95
0.02 lb	1AD2-Dot	Rice Lake	0.23	0.23	0.22	2	10686	1.8	7.95
0.02 lb	1AD2-No Dot	Rice Lake	0.09	0.09	0.22	2	10686	1.8	7.95
1/4 oz	L486	Rice Lake	0.22	0.22	0.21	2.102	27	1.7	7.95
1/4 oz	KSCI Shop	Rice Lake	0.52	0.52	0.21	2.102	27	1.7	7.95
1/4 oz	4A	Rice Lake	-0.29	-0.29	0.21	2.102	27	1.7	7.95

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0.01 lb	1BD1	Rice Lake	0.43	0.43	0.19	2.23	12	1.5	7.95
0.01 lb	1BD2	Rice Lake	0.75	0.75	0.19	2.23	12	1.5	7.95
0.01 lb	1AD2	Rice Lake	0.65	0.65	0.19	2.23	12	1.5	7.95
1/8 oz	KSCI Shop	Rice Lake	0.71	0.71	0.18	2	14722	1.3	7.84
1/8 oz	4A	Rice Lake	0.86	0.86	0.18	2	14722	1.3	7.84
1/8 oz	L486	Rice Lake	0.45	0.45	0.18	2	14722	1.3	7.84
0.005 lb	1BD2	Rice Lake	0.76	0.76	0.16	2.23	12	1.2	2.7
0.005 lb	1BD1	Rice Lake	0.23	0.23	0.16	2.23	12	1.2	2.7
0.005 lb	1AD2	Rice Lake	0.53	0.53	0.16	2.23	12	1.2	2.7
1/16 oz	4A	Rice Lake	-0.29	-0.29	0.14	2.21	43	1.1	7.95
1/16 oz	L486	Rice Lake	0.32	0.32	0.14	2.21	43	1.1	7.95
0.002 lb	1BD2-Dot	Rice Lake	0.6	0.6	0.14	2.23	12	0.87	2.7
0.002 lb	1BD2-No Dot	Rice Lake	0.16	0.16	0.14	2.23	12	0.87	2.7
0.002 lb	1BD1- Dot	Rice Lake	0.29	0.29	0.14	2.23	12	0.87	2.7
0.002 lb	1BD1- No Dot	Rice Lake	0.31	0.31	0.14	2.23	12	0.87	2.7
0.002 lb	1AD2-Dot	Rice Lake	0.43	0.43	0.14	2.23	12	0.87	2.7
0.002 lb	1AD2-No Dot	Rice Lake	0.46	0.46	0.14	2.23	12	0.87	2.7
1/32 oz	KSCI Shop-Dot	Rice Lake	0.54	0.54	0.12	2.28	10	0.87	7.95
1/32 oz	KSCI Shop-No Dot	Rice Lake	-0.04	-0.04	0.12	2.28	10	0.87	7.95
1/32 oz	4A-Dot	Rice Lake	0.61	0.61	0.12	2.28	10	0.87	7.95
1/32 oz	4A- No Dot	Rice Lake	-0.51	-0.51	0.12	2.28	10	0.87	7.95
1/32 oz	L486	Rice Lake	0.47	0.47	0.12	2.28	10	0.87	7.95
0.001 lb	1BD2	Rice Lake	-0.128	-0.128	0.09	2.23	12	0.7	2.7
0.001 lb	1BD1	Rice Lake	0.554	0.554	0.09	2.23	12	0.7	2.7
0.001 lb	1AD2	Rice Lake	0.133	0.133	0.09	2.23	12	0.7	2.7

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Traceability Statement

The artifact(s) described in this calibration certificate have been compared to the Standards of the State of Indiana. The Standards of the State of Indiana are traceable to the National Institute of Standards and Technology (NIST) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and measurement traceability within the level of uncertainty reported by this laboratory. The International System of Units (SI) for mass is the kilogram (kg) (see Conversion Factors below). The certificate number for this calibration is the only unique number to be used in referencing measurement traceability for the artifact(s) described in this calibration certificate.

Uncertainty Statement

The combined standard uncertainty includes uncertainties reported for the standard, uncertainties associated with the measurement process, uncertainties for any observed deviations from reference values which are less than surveillance limits (previous similar determinations have demonstrated that the maximum permissible errors are sufficiently large that buoyancy corrections are not usually significant [i.e., corrections & their uncertainty will not change the last decimal place of the calibration value or uncertainty (with uncertainty rounded to 2 significant digits)]. The combined standard uncertainty is multiplied by a coverage factor, k , to give the expanded uncertainty, which defines an interval with an approximate 95 % level of confidence. The expanded uncertainty presented in this calibration certificate is consistent with NIST Technical Note 1297. Surface Roughness and Magnetic testing has not been performed, therefore, there are no components for the effects of either in the uncertainty budget.

Pertinent Information

- In-accordance-with ISO/IEC FDIS 17025, General Requirements for the Competence of Testing and Calibration Laboratories, paragraph 5.10.4.4 'A calibration certificate (or calibration label) shall not contain any recommendation on the calibration interval except where this has been agreed with the client. This requirement may be superseded by legal regulations.'
- In-accordance-with Indiana Code (IC) 24-6-3-2, Division of weights and measures; powers and duties, Section 2(b), '...The division, or inspectors at the divisions direction, shall correct the standards of the several cities and counties, and as often as once in two (2) years compare the same with those in the division's possession, and where not otherwise provided by law the division shall have the general supervision of the weights, measures, and measuring and weighing devices in use in Indiana...'
- The artifact(s) listed above have been found and/or left within the maximum permissible error for the specification stated above, except as noted. An artifact is considered in-compliance when the correction plus the measurement uncertainty is equal to or less than the maximum permissible error. **BOLD** print indicates an out-of-compliance reading.
- All corrections stated in this calibration certificate correlate to a "Conventional Mass" (CM), also known as 'apparent mass', scale verses 8.0 g/cm^3 reference mass density and an air density of 1.2 mg/cm^3 at $20 \text{ }^\circ\text{C}$.
- The results listed in this calibration certificate relate only to the artifacts described and extent of calibrations performed.

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Conversion Factors

From NIST Special Publication 811, *Guide for the Use of the International System of Units (SI)*

Factors in **boldface** are exact

To convert from	to	multiply by
carat, metric	to kilogram (kg)	2.0 E-04
grain (gr)	to kilogram (kg)	6.479 891 E-05
ounce (avoirdupois) (oz)	to kilogram (kg)	2.834 952 E-02
ounce (troy or apothecary) (oz)	to kilogram (kg)	3.110 348 E-02
dram (apothecary) (dr)	to kilogram (kg)	3.8879346 E-03
scruple (apothecary) (s)	to kilogram (kg)	1.2959782 E-03
pennyweight (dwt)	to kilogram (kg)	1.555 174 E-03
pound (avoirdupois) (lb)	to kilogram (kg)	4.535 923 7 E-01

I declare or certify under penalty of perjury under the laws of the State of Indiana that the foregoing is true and correct:

Signed on this 17th day of July, 2020 in the city of Indianapolis, Marion County, Indiana

Signature: Howard Wickersham
Howard Wickersham, State Metrologist, Technical Manager