CERTIFICATE OF CALIBRATION

Issue:- 97277_10 | Certificate Number: **97277** | Date of Issue: **28-Mar-24**

Approved Signatory: **Tom Williams**

Page 1 of 2 | Signed: T. W

UKAS CALIBRATION 0352

Kent County Council kent.gov.uk

Submitter:-
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Issued by:-
Kent Scientific Services
8 Abbey Wood Road
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ME19 4YT
Tel: 03000 415 100
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EQUIPMENT:	Weights Weight set FR1
SERIAL NUMBER:	J01 - J14, Z
MAKE/TYPE:	N/A
STANDARDS USED:	Set 12412
DATE RECEIVED:	26 March 2024
DATE CALIBRATED:	28 March 2024
DETAILS:	14 Cast Iron, 10 Brass

MEASUREMENTS:

Kent Scientific Services method used: CAL SMALL, Calibration of Small Masses.
The calibrations took place in a controlled environment with the temperature held between 18°C and 22°C, and with the relative humidity held between 40% and 60%.
The measurement results obtained in the table, where each measured value given represents not the true mass, but the mass of a hypothetical weight of density 8,000 $kg.m^{-3}$, which in air of density 1.2 $kg.m^{-3}$ would balance the corresponding weight identified in the first column at 20°C.
The method of weighing was by substitution (Borda's method). In each instance the standard weight used had been calibrated by UKAS Calibration Laboratory number 0474, 0260 or 0352 within the previous three years.
The uncertainty of measurements for each of the different denominations is listed in the last column of the table
Duplicate weights, where present, are indicated by a dot or dots.
Customer supplied information is notated with a ~, and results relate only to the item(s) calibrated.
Unless otherwise notated, samples are tested in as received condition at Kent Scientific Services.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

TABLE OF MEASUREMENT RESULTS

Identity Mark	Nominal Mass	Measured Value	Error from Nominal	Estimated Uncertainty
J11	100N	10192.09 g	- 70 mg	± 110 mg
J12	100N	10192.13 g	- 30 mg	± 110 mg
J13	100N	10192.02 g	- 140 mg	± 110 mg
J14	100N	10192.04 g	- 120 mg	± 110 mg
J10	50N	5096.036 g	- 46 mg	± 52 mg
J08	20N	2038.357 g	- 76 mg	± 21 mg
J09	20N	2038.410 g	- 23 mg	± 21 mg
J07	10N	1019.186 g	- 30 mg	± 11 mg
J06	5N	509.574 8 g	- 33.3 mg	± 5.1 mg
J015	5N	509.537 1 g	- 71.1 mg	± 5.1 mg
J02	1N	101.912 9 g	- 8.8 mg	± 1.1 mg
J03	1N	101.914 6 g	- 7.1 mg	± 1.1 mg
J04	1N	101.910 0 g	- 11.6 mg	± 1.1 mg
J05	1	101.915 0 g	- 6.7 mg	± 1.1 mg
J01	0.5N	50.947 94 g	- 12.87 mg	±1.61 mg
Z	100g	99.998 3 g	- 1.7 mg	± 1.0 mg
Z°	100g	100.000 0 g	0.0 mg	± 1.0 mg
Z	50g	50.000 34 g	+ .34 mg	± 1.60 mg
Z	20g	20.000 57 g	+ .57 mg	± 1.50 mg
Z°	20g	20.000 97 g	+ .97 mg	± 1.50 mg
Z	10g	10.001 11 g	+ 1.11 mg	± 0.40 mg
Z	5g	5.000 83 g	+ .83 mg	± 0.30 mg
Z	2g	2.000 58 g	+ .58 mg	± 0.24 mg
Z°	2g	2.000 63 g	+ .63 mg	± 0.24 mg
J06	* 5N	509.608 5 g	+ .4 mg	± 5.1 mg
J015	* 5N	509.602 1 g	- 6.1 mg	± 5.1 mg
J02	* 1N	101.922 3 g	+ .7 mg	± 1.1 mg
J03	* 1N	101.922 0 g	+ .4 mg	± 1.1 mg
J04	* 1N	101.922 7 g	+ 1.1 mg	± 1.1 mg
J05	* 1N	101.922 2 g	+ .6 mg	± 1.1 mg

*Denotes Post Adjustment Calibration.

The basis for conversion between force units and mass units is that a 1kg mass will experience a force of g newtons where g is the strength of the local gravitational field. At Kent Scientific Services the estimated local $g = 9.81146\ ms^{-2}$.

END OF RESULTS

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.