


CERTIFICATE OF CALIBRATION

Issue:- Certificate Number: **94071A**
94071_21A Date of Issue: **06-Mar-20**
Approved Signatory: **Kim Hutchins**
Page 1 of 2 Signed: 



Submitter:-

Mecmesin Limited
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Issued by:-

Kent Scientific Services
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Kent
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Tel: 03000 415 100
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EQUIPMENT: Weights
SERIAL NUMBER: AH8 (P01 to P015), AH9 (T)
MAKE/TYPE: N/A
STANDARDS USED: Set 12412
DATE RECEIVED: 28 February 2020
DATE CALIBRATED: 4 March 2020
DETAILS: 11 Brass, 14 Cast Iron

MEASUREMENTS:

Kent Scientific Services method used: CAL-M2, 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 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 to the item calibrated.

Unless otherwise notated, samples are tested in as received condition at Kent Scientific Services.

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TABLE OF MEASUREMENT RESULTS

| <u>Identity Mark</u> | <u>Nominal Mass</u> | <u>Measured Value</u> | <u>Error from Nominal</u> | <u>Estimated Uncertainty</u> |
|----------------------|---------------------|-----------------------|---------------------------|------------------------------|
| T | 1 g | 1.000 78 g | + 0.78 mg | ± 0.20 mg |
| T | 2 g | 2.001 00 g | + 1.00 mg | ± 0.24 mg |
| T | 2 g | 2.000 86 g | + 0.86 mg | ± 0.24 mg |
| T | 5 g | 5.001 28 g | + 1.28 mg | ± 0.30 mg |
| T | 10 g | 10.001 48 g | + 1.48 mg | ± 0.40 mg |
| T | 20 g | 20.002 17 g | + 2.17 mg | ± 0.50 mg |
| T | 20 g | 20.001 96 g | + 1.96 mg | ± 0.50 mg |
| T | 50 g | 50.002 67 g | + 2.67 mg | ± 0.60 mg |
| T | 200 g | 200.002 4 g | + 2.4 mg | ± 2.0 mg |
| T | 200 g | 200.005 6 g | + 5.6 mg | ± 2.0 mg |

| <u>Identity Mark</u> | <u>Nominal Force</u> | <u>Measured Value</u> | <u>Error from Nominal</u> | <u>Estimated Uncertainty</u> |
|----------------------|----------------------|-----------------------|---------------------------|------------------------------|
| P01 | 0.5 N | 50.961 37 g | + 0.55 mg | ± 0.61 mg |
| P02 | 1 N | 101.924 7 g | + 3.0 mg | ± 1.1 mg |
| P03 | 1 N | 101.924 5 g | + 2.9 mg | ± 1.1 mg |
| P04 | 1 N | 101.920 9 g | - 0.8 mg | ± 1.1 mg |
| P05 | 1 N | 101.924 2 g | + 2.6 mg | ± 1.1 mg |
| P06 | 5 N | 509.623 6 g | + 15.5 mg | ± 5.1 mg |
| P07 | 10 N | 1,019.212 g | - 4 mg | ± 11 mg |
| P08 | 20 N | 2,038.402 g | - 30 mg | ± 21 mg |
| P09 | 20 N | 2,038.361 g | - 71 mg | ± 21 g |
| P10 | 50 N | 5,096.009 g | - 73 mg | ± 51 mg |
| P11 | 100 N | 10,192.09 g | - 80 mg | ± 110 mg |
| P12 | 100 N | 10,192.26 g | + 100 mg | ± 110 mg |
| P13 | 100 N | 10,192.28 g | + 110 mg | ± 110 mg |
| P14 | 100 N | 10,192.21 g | + 40 mg | ± 110 mg |
| P015 | 5 N | 509.618 1 g | + 10.0 mg | ± 5.1 mg |

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 $g = 9.81146 \text{ ms}^{-2}$.

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