# CERTIFICATE OF CALIBRATION

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|---|---|---|
| Issue:- | Certificate Number: | **98046** |
| 98046_10 | Date of Issue: | **25-Apr-25** |
| | Approved Signatory: | **Mark Norfolk** |
| Page 1 of 2 | Signed: | |

UKAS CALIBRATION 0352

Kent County Council kent.gov.uk

**Submitter:-**
Mecmesin Limited
Newton House
Spring Copse Business Park
Slinfold
West Sussex
RH13 0SZ

**Issued by:-**
Kent Scientific Services
8 Abbey Wood Road
Kings Hill
West Malling
Kent
ME19 4YT
**Tel: 03000 415 100**
**Fax: 01732 220006**

**EQUIPMENT:** Weights Weight set FR1

**SERIAL NUMBER:** J01 - J14, Z

**MAKE/TYPE:** N/A

**STANDARDS USED:** Set 12412

**DATE RECEIVED:** 11 April 2025

**DATE CALIBRATED:** 17 April 2025

**DETAILS:** 13 Cast Iron, 11 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.

# TABLE OF MEASUREMENT RESULTS

| Identity Mark | | Nominal Mass | Measured Value | Error from Nominal | Estimated Uncertainty |
|---|---|---|---|---|---|
| J01 | | 0.5N | 51.844 87 g | + 884.05 mg | ± 1.61 mg |
| J02 | | 1N | 101.906 0 g | - 15.6 mg | ± 1.1 mg |
| J03 | | 1N | 101.914 5 g | - 7.2 mg | ± 1.1 mg |
| J04 | | 1N | 101.916 1 g | - 5.6 mg | ± 1.1 mg |
| J05 | | 1N | 101.912 0 g | - 9.6 mg | ± 1.1 mg |
| J06 | | 5N | 509.588 3 g | - 19.8 mg | ± 5.1 mg |
| J07 | | 10N | 1019.163 g | - 54 mg | ± 11 mg |
| J08 | | 20N | 2038.339 g | - 93 mg | ± 21 mg |
| J09 | | 20N | 2038.395 g | - 38 mg | ± 21 mg |
| J10 | | 50N | 5096.025 g | - 57 mg | ± 52 mg |
| J11 | | 100N | 10192.06 g | - 100 mg | ± 110 mg |
| J12 | | 100N | 10192.11 g | - 50 mg | ± 110 mg |
| J13 | | 100N | 10192.00 g | - 160 mg | ± 110 mg |
| J14 | | 100N | 10191.97 g | - 190 mg | ± 110 mg |
| J01 | * | 0.5N | 50.827 97 g | - 132.84 mg | ± 1.61 mg |
| J02 | * | 1N | 101.9235 g | + 1.8 mg | ± 1.1 mg |
| J03 | * | 1N | 101.9250 g | + 3.3 mg | ± 1.1 mg |
| J04 | * | 1N | 101.9226 g | + 1.0 mg | ± 1.1 mg |
| J05 | * | 1N | 101.9235 g | + 1.8 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 $ms^{-2}$.

| Identity Mark | Nominal Mass | Measured Value | Error from Nominal | Estimated Uncertainty |
|---|---|---|---|---|
| Z | 100 g | 99.9973 g | - 2.7 mg | ± 1.0 mg |
| Z | 100 g° | 99.9987 g | - 1.3 mg | ± 1.0 mg |
| Z | 50 g | 50.0002 1 g | + 0.21 mg | ± 0.60 mg |
| Z | 20 g | 20.0004 0 g | + 0.40 mg | ± 0.50 mg |
| Z | 20 g° | 20.0009 2 g | + 0.92 mg | ± 0.50 mg |
| Z | 10 g | 10.0009 7 g | + 0.97 mg | ± 0.40 mg |
| Z | 5 g | 5.0008 6 g | + 0.86 mg | ± 0.30 mg |
| Z | 2 g | 2.0005 7 g | + 0.57 mg | ± 0.24 mg |
| Z | 2 g° | 2.0006 5 g | + 0.65 mg | ± 0.24 mg |
| Z | 1 g | 1.0007 9 g | + 0.79 mg | ± 0.20 mg |

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.**