CERTIFICATE OF CALIBRATION

Issue:-	Certificate Number:	**97110**
97110_10	Date of Issue:	**04-Jan-24**
	Approved Signatory:	**Tom Williams**
Page 1 of 4	Signed:	T. W

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
SERIAL NUMBER:	MC3
MAKE/TYPE:	N/A
STANDARDS USED:	Set 12412
DATE RECEIVED:	20 December 2023
DATE CALIBRATED:	4 January 2024
DETAILS:	112 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 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
1957	100 N	10192.13 g	- 30 mg	± 110 mg
1958	100 N	10191.79 g	- 380 mg	± 110 mg
2055	100 N	10192.47 g	+ 310 mg	± 110 mg
2056	100 N	10192.54 g	+ 380 mg	± 110 mg
2057	100 N	10192.54 g	+ 380 mg	± 110 mg
2058	100 N	10192.38 g	+ 220 mg	± 110 mg
2059	100 N	10192.43 g	+ 270 mg	± 110 mg
2060	100 N	10192.13 g	- 40 mg	± 110 mg
2061	100 N	10192.18 g	+ 20 mg	± 110 mg
2062	100 N	10192.33 g	+ 170 mg	± 110 mg
3020	100 N	10191.98 g	- 180 mg	± 110 mg
3362H	100 N	10191.73 g	- 430 mg	± 110 mg
2047	50 N	5096.227 g	+ 145 mg	± 51 mg
2048	50 N	5096.204 g	+ 123 mg	± 51 mg
2049	50 N	5096.257 g	+ 175 mg	± 51 mg
2050	50 N	5096.189 g	+ 108 mg	± 51 mg
2051	50 N	5096.262 g	+ 180 mg	± 51 mg
2052	50 N	5096.327 g	+ 245 mg	± 51 mg
2053	50 N	5096.247 g	+ 165 mg	± 51 mg
2054	50 N	5096.059 g	- 22 mg	± 51 mg
3021	50 N	5096.217 g	+ 135 mg	± 51 mg
3362F	50 N	5096.254 g	+ 173 mg	± 51 mg
3362G	50 N	5096.269 g	+ 188 mg	± 51 mg
1960	20 N	2038.492 g	+ 60 mg	± 21 mg
1961	20 N	2038.414 g	- 19 mg	± 21 mg
2039	20 N	2038.599 g	+ 166 mg	± 21 mg
2040	20 N	2038.583 g	+ 151 mg	± 21 mg
2041	20 N	2038.530 g	+ 97 mg	± 21 mg
2042	20 N	2038.551 g	+ 119 mg	± 21 mg
2043	20 N	2038.601 g	+ 169 mg	± 21 mg
2044	20 N	2038.433 g	+ 1 mg	± 21 mg
2045	20 N	2038.490 g	+ 58 mg	± 21 mg
2046	20 N	2038.440 g	+ 8 mg	± 21 mg
3022	20 N	2038.493 g	+ 61 mg	± 21 mg
3023	20 N	2038.511 g	+ 79 mg	± 21 mg
3362A	20 N	2038.410 g	- 22 mg	± 21 mg
3362B	20 N	2038.533 g	+ 100 mg	± 21 mg
3362C	20 N	2038.528 g	+ 96 mg	± 21 mg
3362D	20 N	2038.480 g	+ 48 mg	± 21 mg
3362M	20 N	2038.425 g	- 8 mg	± 21 mg
3515	20 N	2038.549 g	+ 117 mg	± 21 mg
3516	20 N	2038.399 g	- 34 mg	± 21 mg
3517	20 N	2038.445 g	+ 13 mg	± 21 mg
3518	20 N	2038.512 g	+ 80 mg	± 21 mg
3519	20 N	2038.454 g	+ 22 mg	± 21 mg
3520	20 N	2038.489 g	+ 56 mg	± 21 mg
3520	20 N	2038.441 g	+ 8 mg	± 21 mg
2039 *	20 N	2038.481 g	+ 48 mg	± 21 mg
2040 *	20 N	2038.506 g	+ 73 mg	± 21 mg
2041 *	20 N	2038.429 g	- 4 mg	± 21 mg
2042 *	20 N	2038.491 g	+ 58 mg	± 21 mg
2043 *	20 N	2038.405 g	- 28 mg	± 21 mg

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.

TABLE OF MEASUREMENT RESULTS contd.

Identity Mark	Nominal Mass	Measured Value	Error from Nominal	Estimated Uncertainty
3362B *	20 N	2038.397 g	- 35 mg	± 21 mg
3362C *	20 N	2038.422 g	- 10 mg	± 21 mg
3515 *	20 N	2038.549 g	+ 117 mg	± 21 mg
1962	10 N	1019.213 g	- 4 mg	± 11 mg
1963	10 N	1019.215 g	- 1 mg	± 11 mg
2031	10 N	1019.219 g	+ 3 mg	± 11 mg
2032	10 N	1019.242 g	+ 25 mg	± 11 mg
2033	10 N	1019.250 g	+ 34 mg	± 11 mg
2034	10 N	1019.247 g	+ 31 mg	± 11 mg
2035	10 N	1019.261 g	+ 44 mg	± 11 mg
2036	10 N	1019.194 g	- 22 mg	± 11 mg
2037	10 N	1019.223 g	+ 6 mg	± 11 mg
2038	10 N	1019.233 g	+ 17 mg	± 11 mg
3024	10 N	1019.209 g	- 7 mg	± 11 mg
3362E	10 N	1019.208 g	- 9 mg	± 11 mg
2021	5 N	509.615 5 g	+ 7.3 mg	± 5.1 mg
2022	5 N	509.601 5 g	- 6.7 mg	± 5.1 mg
2023	5 N	509.615 2 g	+ 7.1 mg	± 5.1 mg
2024	5 N	509.602 3 g	- 5.8 mg	± 5.1 mg
2025	5 N	509.612 3 g	+ 4.2 mg	± 5.1 mg
2026	5 N	509.621 7 g	+ 13.5 mg	± 5.1 mg
2027	5 N	509.623 1 g	+ 15.0 mg	± 5.1 mg
2028	5 N	509.596 7 g	- 11.4 mg	± 5.1 mg
2029	5 N	509.612 6 g	+ 4.4 mg	± 5.1 mg
2030	5 N	509.636 3 g	+ 28.2 mg	± 5.1 mg
3500	5 N	509.591 1 g	- 17.1 mg	± 5.1 mg
3501	5 N	509.599 8 g	- 8.4 mg	± 5.1 mg
3502	5 N	509.604 2 g	- 4.0 mg	± 5.1 mg
3503	5 N	509.596 0 g	- 12.2 mg	± 5.1 mg
3504	5 N	509.592 5 g	- 15.6 mg	± 5.1 mg
2001	1 N	101.922 0 g	+ .3 mg	± 1.1 mg
2002	1 N	101.918 6 g	- 3.1 mg	± 1.1 mg
2003	1 N	101.915 5 g	- 6.2 mg	± 1.1 mg
2004	1 N	101.919 8 g	- 1.9 mg	± 1.1 mg
2005	1 N	101.919 2 g	- 2.4 mg	± 1.1 mg
2006	1 N	101.920 5 g	- 1.1 mg	± 1.1 mg
2007	1 N	101.917 6 g	- 4.1 mg	± 1.1 mg
2008	1 N	101.916 4 g	- 5.3 mg	± 1.1 mg
2009	1 N	101.920 6 g	- 1.1 mg	± 1.1 mg
2010	1 N	101.920 2 g	- 1.5 mg	± 1.1 mg
2011	1 N	101.921 1 g	- .6 mg	± 1.1 mg
2012	1 N	101.918 3 g	- 3.3 mg	± 1.1 mg
2013	1 N	101.919 7 g	- 1.9 mg	± 1.1 mg
2013	1 N	101.919 8 g	- 1.9 mg	± 1.1 mg
2014	1 N	101.913 8 g	- 7.8 mg	± 1.1 mg
2015	1 N	101.918 9 g	- 2.7 mg	± 1.1 mg
2016	1 N	101.921 0 g	- .6 mg	± 1.1 mg
2017	1 N	101.922 3 g	+ .7 mg	± 1.1 mg
2018	1 N	101.918 7 g	- 3.0 mg	± 1.1 mg
2019	1 N	101.917 3 g	- 4.3 mg	± 1.1 mg
2020	1 N	101.918 3 g	- 3.4 mg	± 1.1 mg
3506	1 N	101.934 6 g	+ 13.0 mg	± 1.1 mg
3507	1 N	101.928 7 g	+ 7.1 mg	± 1.1 mg
3508	1 N	101.921 2 g	- .5 mg	± 1.1 mg
3509	1 N	101.925 2 g	+ 3.6 mg	± 1.1 mg

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.

TABLE OF MEASUREMENT RESULTS contd.

Identity Mark	Nominal Mass	Measured Value	Error from Nominal	Estimated Uncertainty
3510	1 N	101.918 6 g	- 3.1 mg	± 1.1 mg
3511	1 N	101.922 2 g	+ .6 mg	± 1.1 mg
3512	1 N	101.920 3 g	- 1.3 mg	± 1.1 mg
3513	1 N	101.919 3 g	- 2.4 mg	± 1.1 mg
3514	1 N	101.922 2 g	+ .5 mg	± 1.1 mg
TBA	1 N	101.924 6 g	+ 3.0 mg	± 1.1 mg
2035 *	10 N	1019.244 g	+ 28 mg	± 101 mg
2030 *	5 N	509.625 5 g	+ 17.4 mg	± 5.1 mg
2003 *	1 N	101.922 1 g	+ .4 mg	± 1.1 mg
2008 *	1 N	101.922 2 g	+ .6 mg	± 1.1 mg
2014 *	1 N	101.924 6 g	+ 3.0 mg	± 1.1 mg
2019 *	1 N	101.923 9 g	+ 2.2 mg	± 1.1 mg
3506 *	1 N	101.923 1 g	+ 1.4 mg	± 1.1 mg
3507 *	1 N	101.919 5 g	- 2.1 mg	± 1.1 mg
1964	10 N	1019.201 g	- 15 mg	± 11 mg
3025	10 N	1019.126 g	- 90 mg	± 11 mg
3362J	10 N	1019.146 g	- 70 mg	± 11 mg
3362K	10 N	1019.073 g	- 143 mg	± 11 mg
3026	5 N	509.556 2 g	- 52.0 mg	± 5.1 mg
3362I	5 N	509.573 4 g	- 34.8 mg	± 5.1 mg
3362L	5 N	509.591 1 g	- 17.1 mg	± 5.1 mg
3025 *	10 N	1019.239 g	+ 23 mg	± 11 mg
3362J *	10 N	1019.212 g	- 5 mg	± 11 mg
3362K *	10 N	1019.206 g	- 10 mg	± 11 mg
3026 *	5 N	509.617 2 g	+ 9.1 mg	± 5.1 mg
3362I *	5 N	509.608 2 g	+ 9.3 mg	± 5.1 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