



Our Ref.: RN210800
File No.: CB/01/0549

5 October 2021

The Manager
Therapeutic Goods Administration Laboratories
PO Box 100
WODEN ACT 2606
Australia

Attention: s22

Dear s22

Subject: Measurement Report RN210800

Enclosed is Measurement Report RN210800 on the Set of weights, 2 kg - 5 g with s/n.: M43649 (M43883, 21601) submitted to this laboratory for examination as per our quotation Q210800.

Please note that the 30 g was not included as mentioned in your email to our s22.

The fee for this service is \$2,540.43. Our Finance Section is handling the payment arrangements and will contact you shortly if necessary.

Yours sincerely,

s22

s22

Mass and Density Standards



Australian Government
Department of Industry, Science,
Energy and Resources

**National
Measurement
Institute**

MEASUREMENT REPORT ON

A Set of Weights, 2 kg – 5 g

Serial number: M43649 (M43883, 21601)



Accredited for compliance with ISO/IEC 17025 - Calibration
Accreditation Number 1.

The National Measurement Institute is responsible for Australia's units and standards of measurement.
The measurement results presented in this report are traceable to Australia's primary standards.

Headquarters

36 Bradfield Road
West Lindfield NSW 2070
Australia

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Australia

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For further information contact:

s22

s22

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Checked: **s22**

Date: 5 October 2021

This report may not be published except in full unless permission for the publication of an approved extract has been obtained in writing from the Chief Metrologist, National Measurement Institute.

For: Therapeutic Goods Administration Laboratories
136 Narrabundah Lane,
SYMONSTON ACT 2609
Australia

Description: 2 kg – 5 g: Stainless steel integral weights

Maker: MASSCAL AUSTRALIA

Serial Number: M43649 (M43883, 21601)

Date(s) of Test: 21 – 30 September 2021

This set of weights has been examined at the National Measurement Institute Lindfield, Bradfield Road, West Lindfield NSW 2070 on the basis of weighings made in air against standards of known mass and density. The calibration performed for the weight 5 g was appropriate for an OIML class E₂ and F₁ for the 2 kg – 10 g weights.

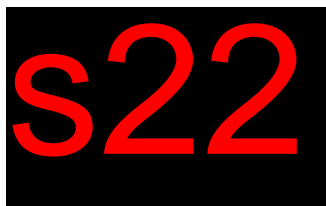
The set of weights was calibrated according to the Test Method and Work Instructions detailed in the NMI Mass and Density Project Operations Manual - The relevant Test Method for this calibration is *MASSDN 8.2.2 Mass Calibrations (OIML classes E₁ to M₁)* and the relevant Work Instruction is *EAF 9.2.12 Mass Calibration Methods*. To obtain the results, which are given on page 3, it was assumed that the density of the 5 g weight lies within the required range for weights of OIML class E₂ and the densities of the 2 kg – 10 g weights lie within the range for weights of OIML class F₁. The set of weights was calibrated in air of density $1.20 \text{ kg}\cdot\text{m}^{-3} \pm 0.03 \text{ kg}\cdot\text{m}^{-3}$. During the course of calibration, the temperature varied between 21.1 °C and 21.3 °C.

The mass value assigned to each weight represents, to within the corresponding uncertainty, the mass of a hypothetical object of density $8000 \text{ kg}\cdot\text{m}^{-3}$ which, in air of density $1.20 \text{ kg}\cdot\text{m}^{-3}$, would balance that weight.

In use, the mass of each weight should be taken as equal to the value given and buoyancy corrections, if required, should be computed on the assumption that the density of the weight is $8000 \text{ kg}\cdot\text{m}^{-3}$. If this procedure is followed, any error arising from the effects of air buoyancy on the 5 g weight will not exceed one half of the OIML E₂ and that on the 2 kg – 10 g weights will not exceed one half of the OIML F₁ uncertainty, provided the density of the air in which the weighings are made lies within the range $1.13 \text{ kg}\cdot\text{m}^{-3}$ to $1.27 \text{ kg}\cdot\text{m}^{-3}$.

| NOMINAL VALUE | MARKING | MASS (g) | UNCERTAINTY (\pm) (g) |
|---------------|------------|--------------|------------------------------|
| 2 kg | 2 kg | 2 000.013 0 | 0.002 9 |
| 2 kg | no marking | 2 000.000 2 | 0.002 9 |
| 1 kg | no marking | 1 000.003 79 | 0.000 27 |
| 500 g | 500 | 500.001 89 | 0.000 20 |
| 300 g | 300g | 300.000 74 | 0.000 19 |
| 200 g | 200 | 199.999 89 | 0.000 07 |
| 150 g | no marking | 150.000 24 | 0.000 17 |
| 100 g | no marking | 100.000 00 | 0.000 05 |
| 50 g | no marking | 50.000 004 | 0.000 031 |
| 20g | • | 20.000 021 | 0.000 016 |
| 20* g | 20 • | 19.999 927 | 0.000 016 |
| 10 g | no marking | 9.999 984 | 0.000 011 |
| 5 g | no marking | 5.000 007 | 0.000 005 |

The uncertainty stated in this Report has been calculated in accordance with the principles in *JCGM 100:2008 – Evaluation of measurement data - Guide to the expression of uncertainty in measurement*, and gives an interval estimated to have a level of confidence of 95%. The coverage factor is equal to 2.0. The uncertainty applies at the time of measurement only and takes no account of any drift or other effects that may apply afterwards. When estimating the uncertainty at any later time, other relevant information should also be considered, including, where possible, the history of the performance of the instrument and the manufacturer's specifications.






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