

APLAC INTERLABORATORY COMPARISON

M027 – Calibration of E2 Weights

INSTRUCTIONS TO LABORATORIES

1. EQUIPMENT

A metal case containing :

1. A stainless steel mass standard marked 20 g
2. A stainless steel mass standard marked 2 g
3. A stainless steel mass standard marked 100 mg
4. A pair of plastic tweezers
5. A pair of gloves

On receipt, unpack the artefacts and inspect them for any defects.

Contact your accreditation body if there is any damage.

The standards should only be manipulated with the supplied tools. They should not be touched with bare hands

A visual inspection of the surfaces of all weights should be made and observations noted on the corresponding paper sheet. The participating laboratory should be informed after the arrival of the set of masses and the results of the visual inspection of the weights and the other relevant items as soon as possible by e-mail or fax message.

The weights should be stored in well-controlled environmental conditions and they should be protected from dust, aerosols and vapors whenever they are not inside the balance before use.

2. MEASUREMENTS TO BE CARRIED OUT

The participating laboratory shall determine the mass of every weight in the set. Before determining the mass of each weight, dust particles should be removed from the surface of the weight using a soft brush. No washing or wiping should be performed.

The participating laboratory are asked to carry out the calibration of these artifacts (determination of conventional mass of weights) by comparison method or by their documented procedures. Please also provide descriptions of the procedures used for the calibration.

Measurement of density of these artifacts is not required. All artifacts are assumed to fulfill the density range of OIML R111 E2 class.



3. DOCUMENTS TO BE SUBMITTED

Within one week of the completion of the measurements, participating laboratories are required to send the attached Result Sheet. No other documents are required. Laboratories should make a copy of the *Result Sheet* for their own records.

Uncertainties shall be calculated using the method in the ISO *Guide to the Expression of Uncertainty in Measurement*. *Uncertainties shall be reported in the expanded uncertainties with the level of confidence of approximately 95 %.*

A final report will be issued at the end of the program with each laboratory only identified by a **confidential** code number.

4. GENERAL INFORMATION

For general queries, please contact your accreditation body. Additional information may be obtained from:

Anang Wahyu Setiawan (Mr)

National Accreditation Body, Indonesia (KAN)

Manggala Wanabakti Building Block IV – 4th floor

Jl. Jendral Gatot Subroto, Senayan – Jakarta

Indonesia; tel +62 21 5747043; facs +62 21 579 20948; email: anang@bsn.go.id cc : anangws@gmail.com

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RESULT SHEET

Laboratory name : _____
 Date of measurement : _____
 Name of accreditation body : _____

1. Calibration Results

Measurement results :

20 g, 2 g, 100 mg – conventional only as density is assumed to be 8000 kg/m³

Nominal value	Conventional mass <i>m</i>	Expanded Uncertainty in level of confidence of approximately 95 % U_{95}	Coverage factor <i>k</i>	Uncertainties in the accredited scope	No. of measurements cycles
20 g					
2 g					
100 mg					

If the reported uncertainty is different from the uncertainties in the accredited scope, please explain the reason below.

Environmental data during calibration (state the maximum and minimum values of temperature, humidity and pressure during measurements)

	Temperature(°C)	Pressure(Pa)	Relative humidity(%)	Air density(kg·m ⁻³)
max				
min				

2. Uncertainty Budget

The uncertainty shall be estimated and combined following the JCGM 100 (2008).

Example :

Component	Uncertainty Contribution (in mg)		
	20 g	2 g	100 mg
Reference standard			
Instability of reference standards			
Weighing process (repeatability)			
Resolution of mass comparator			
Sensitivity of balance			
Bouyancy			
.....			
u_c			
Effective degrees of freedom			

3. Details of Balances Used for Calibration

Manufacturer	Type	Maximum load	Resolution	Standard Deviation	Manual/Automatic

4. Details of instruments used for air density determination

	Manufacturer	Type	Range	Resolution	Expanded Uncertainty (95 %)
Temperature					
Humidity					
Pressure					

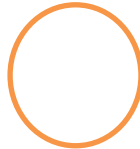
5. Traceability

Insert the standards including additional weights used for the calibration and their traceability.

Identification	Mass m	Uncertainty $U_{95\%}$	Volume V	Uncertainty U_V	Calibration date

6. Record of the surface of the artifacts

Top Surface



Rolled out
side surface



Base Surface

