The *mise en pratique* of the (new) definition of the kilogram (*mep*-kg)

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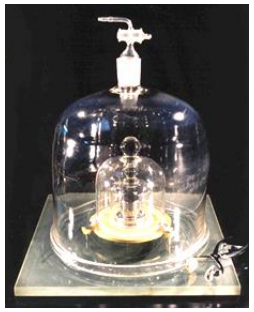
We already have a *mep*-kg for the **present** definition. (this *mep* is very brief—less than 1 page)

See 8th edition of ***SI Brochure***, Appendix 2
http://www.bipm.org/en/publications/mises-en-pratique/kilogram.html

The *mep*

- Restates the present definition of the kilogram based on the mass of the international prototype of the kilogram (IPK).
- Recalls storage conditions and cleaning procedures for the IPK, citing basic references from *PV CIPM* and *metrologia*.
- States the general need to correct mass comparisons for air buoyancy.
- States that dissemination to secondary standards is "a conceptually simple procedure".



$m(\mathrm{IPK}) \equiv 1\ \mathrm{kg} \equiv \mathrm{kg}$

The IPK is the primary realization of the SI kilogram.

(The IPK is also the primary mass standard from which the kilogram is disseminated to secondary standards.)

Overview of **Draft** (v. 9.0) of the *mep*-kg **after** redefinition. It is 18 pages long.

See document **CCM/15-02A**

http://www.bipm.org/cc/CCM/Allowed/15/02A_MeP_kg_141022_v-9.0_clean.pdf

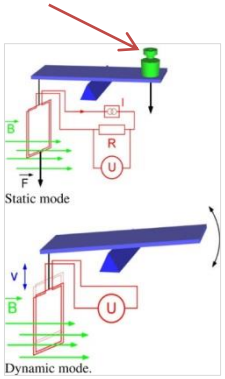
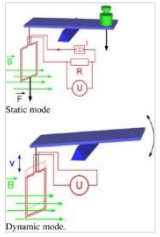


Table of Contents…



$$m_x = h\left(\frac{bf^2}{4}\right)\frac{1}{gv}$$

$$m_s = N\, m_a(^{28}\mathrm{Si}) \qquad N = 8\frac{V_S}{a(^{28}\mathrm{Si})^3} \longrightarrow m_s = h\ N\ \frac{m_a(^{28}\mathrm{Si})}{h}$$

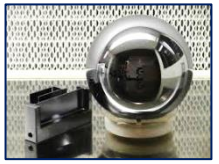


Table of Contents…

A series of Annexes follows :

A1. History leading to the redefinition of the kilogram

A2. Traceability to units derived from the kilogram

A2.1 *Coherent derived units expressed in terms of base units kg m^p s^q*

A2.2 *Electrical units*

A2.3 *Units involving the kelvin and the candela*

A2.4 *Atomic, subatomic and molecular units*

A2.4.1 What has changed

A2.4.2 What has not changed

A3. Maintence of primary realizations

A4. Maintenance of mass correlation among artefacts calibrated by NMIs or DIs realizing the kilogram (optional)

A closer look at Section 3: Dissemination of the mass unit

3.1 Dissemination from a particular realization of the kilogram (a)

- The dissemination of the mass unit is based on **primary mass standards** obtained from the realization of the kilogram definition.
- All **relevant influences on a primary mass standard must be considered** for the maintenance and dissemination of the mass unit…
- The BIPM in coordination with the CCM organizes an **on-going BIPM key comparison**, BIPM.M-K1, for laboratories with primary realization methods.
- The **CCM decides** the required periodicity of laboratory participation in BIPM.M-K1 in order to support relevant calibration and measurement capabilities (CMCs).

3.1 Dissemination from a particular realization of the kilogram (b)

- **In cases where compliance with the CIPM MRA is required**, it is essential that mass standards are traceable to primary mass standards of a participant in BIPM.M-K1 that has relevant CMC entries or, **in the case of the BIPM**, suitable entries in its calibration and measurement services as approved by the CIPM. **[CIPM-MRA]**
- **Dissemination of the mass scale is validated** for all NMIs/DIs and the BIPM **through the traditional types of key comparisons** organized prior to the [new] definition of the kilogram. **[CIPM-MRA]**
- **Results of all key comparisons are published in the KCDB** in accordance with the rules of CIPM MRA and may be used in support of NMI/DI claims of its calibration and measurement capabilities (CMCs) and the BIPM claims listed in its calibration and measurement services. **[CIPM-MRA]**

History of draft 9.0

- A document history comprises last pages of the draft.

History begins with draft 1.0, dated 10.06.2010…

…Through CCM Workshop on the *mep*: 21-22.11.2012, where draft 6.0 was debated. Comments were henceforth tracked and dealt with explicitly using a standard template…

…To draft 9.0, dated 10.12.2014 "Following comments and suggestions received on draft 8.7 and actions of the 25th meeting of the CGPM (2014)"

Approval of the final version at the next meeting of the CCM: 15-19.05.2017