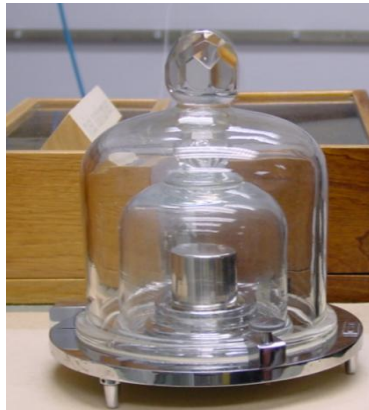


# Euramet project 1210

Best practice for dissemination of the kilogram

*collaboration in traceability*



PtIr



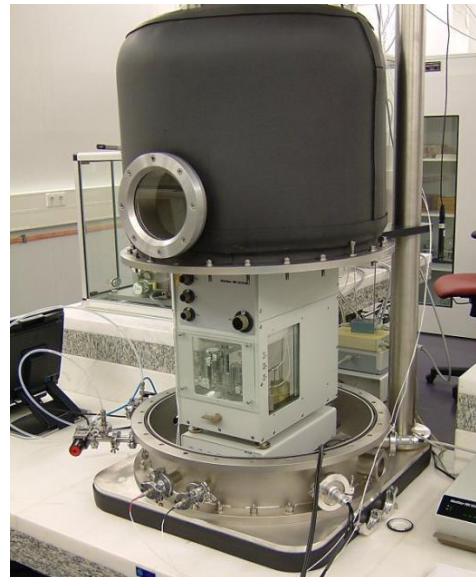
mass standards

Inge van Andel (VSL)

# Background

Previous projects :

1993 Euramet project 231  
mass & uncertainty calculation  
2008 A. Vâlcu, D. Dinu  
subdivision vs. multiplication



# Background

New equipment available :

- room for more weights
- creates combinations
- more measurements
- new limitations
- higher accuracy



# Questions



Do we need new subdivision schemes ?

- optimum combination of weights per device
- how many measurements
- multiple or single reference standards
- are there 'bad' equations
- best calculation methods
- ....

**What is the best practice to disseminate the kilogram ?**



# Euramet project 1210

## Participants

- VSL
- CEM
- MIRS
- BEV
- METAS
- EIM
- INM
- MIKES
- NSAI NML
- CMI



**Most frequently offered activity :  
test subdivision schemes**

# Objectives



1. establish which schemes, calculation methods (including uncertainty evaluation methods, statistical tools for evaluation of the measurement process) and equipment are presently used
2. determine if it is possible to optimize the subdivision schemes for different types of robots and mass handlers, and for different typical compositions of weight sets, taking into account efficiency, measurement uncertainty and robustness
3. provide guidelines for the best practice to disseminate the kilogram



# Planning

period	WP	activity	status
Oct - Nov 2011	0.1	initiate & register project	✓
Feb - Mar 2012	0.2	kick-off meeting	✓
Feb - Mar 2012	1.1	set-up of inventory document	in progress
Apr -May 2012	1.2	filling of inventory document	
Jun - Sep 2012	1.3	analysis of inventory document	
Oct - Nov 2012	1.4	decision on next steps	
Dec - Mar 2012	2.1	measurements on various schemes	
Dec - Mar 2012	2.2	experiments with calculation methods	
Apr - May 2013	2.3	compare/analyse results	
Jun - Aug 2013	2.4	decision on next steps	
Sep - Jan 2013	3.1	write guidelines document	
Feb - Mar 2014	3.2	final presentation	

# First steps

- kick-off meeting (29 Feb. 2012)
  - discussed :
    - o presently used methods
    - o tricks & problems
    - o other studies (KRISS, NIST, ...)
    - o set-up for inventory document
    - o input needed from everybody
- **basis for next steps**



# Inventory document

<b>measurements</b>	<b>calculations</b>
balance/robot/handler	mathematical base
schemes	corrections (buoyancy, COG, ...)
weighing cycle (RTR, RTTR)	matrix set-up (weighting factors, handling of repeats & decades)
no. of loadings no. of pre-weighings	no. of reference standards, check weights or other objects
no. of repeats	software
no. of compositions	handling of outliers

**comments, additions, ... ?**