ЕВРО-АЗИАТСКОЕ СОТРУДНИЧЕСТВО ГОСУДАРСТВЕННЫХ МЕТРОЛОГИЧЕСКИХ УЧРЕЖДЕНИЙ

COOMET

EURO-ASIAN COOPERATION OF NATIONAL METROLOGICAL INSTITUTIONS

Activity Report of COOMET TC 1.6
"Mass and Related Quantities"

Irena Kolozinska
Chair of COOMET TC-M (1.6)

18th meeting of the CCM
20–21 May, 2021 online

MEETINGS

24th Meeting of COOMET TC-M, October, 1 – 2, 2019, St. Petersburg, Russia

Agenda:
- reports of the participants of the meeting;
- discussion of the current state of affairs in TC on the submission and review of CMCs, both intra- and interregional;
- discussion of the redefinition of kilogram;
- information on the progress of the current projects.

Participants:
More than 38 representatives from 18 NMIs from COOMET and EURAMET

25th Meeting of COOMET TC-M October, 6, 2020, online

Agenda:
- discussion of the current state and progress of COOMET TC-M projects;
- The **webinar** "Redefinition of the kilogram and its impact on mass metrology";
- The webinar “About KCDB 2.0. How to start working”

Fundamental constants from the point of view of fundamental physics
Andrey Surzhyhkov, PTB, Germany

Traceability in mass measurements with a new SI implementation
Nieves Medina Martín, CEM, Spain

Impact of the new definition of the kilogram on NMI and BIPM
Michael Stock, BIPM, France

Participants:
More than 50 representatives from 18 NMIs from COOMET and EURAMET

COMPARISONS

Mass

Identifier	Description	Pilot	Participants	Status
COOMET.M.M-S2	Supplementary bilateral comparison in the field of mass measurements Mass of 200 mg, 1g, 50 g, 200 g and 1 kg	NSC "IM", Ukraine	NMI (MD), Moldova	Report in progress, draft A
COOMET.M.M-S3	Comparison of mass standards Mass standards of 100 mg, 20 g, 1 kg and 10 kg	NMI (MD), Moldova	INM, Romania PTB, Germany	Report in progress, draft B
COOMET.M.M-S4	Comparison of mass standards Mass: 5 kg, 500 g, 20 g, 2 g and 100 mg	AzMI, AZ, Azerbaijan	CMI, Czechia	Approved CMCs published
COOMET.M.M-S5	Comparison of mass standards Mass: 50 mg, 50 g, 1 kg and 2 kg	NSC "IM", Ukraine	BelGIM , Belarus GEOSTM,Georgia INIMET, Cuba KazStandard, Kazakhstan PTB, Germany UME, Turkey VMC, Lithuania VNIIM, Russia	Report in progress, draft A

COMPARISONS

Pressure

Identifier	Description	Pilot	Participants	Status
COOMET.M.P-K15	Pressure measurements (absolute mode) Absolute pressure: 0.3 mPa, 0.9 mPa, 0.003 Pa, 0.009 Pa, 0.03 Pa, 0.09 Pa, 0.3 Pa, 0.9 Pa	UME, Turkey	VNIIM, RU	Report in progress, draft A
COOMET.M.P-S1	Comparison of standards of gauge pressure Gauge pressure: 1 MPa to 10 MPa	NSC IM, Ukraine	NMI, Moldova VMT/VMC, Lithuania VNIIM, Russia BelGIM, Belarus KazInMetr, Kazakhstan	Report in progress, draft A
COOMET.M.P-S2	Pressure measurements (absolute mode) Absolute pressure : 0.03 Pa, 0.09 Pa, 0.3 Pa, 0.9 Pa, 3 Pa, 9 Pa, 13 Pa	UME, Turkey	VNIIM, Russia	Abandoned
COOMET.M.P-S3	Comparison of pressure standards in the range from 250 MPa to 1500 MPa	PTB, Germany	VNIIFTRI, Russia	Report in progress, draft A
COOMET.M.P-S4	Pressure measurements (absolute (0 MPa to 7 MPa) and gauge mode (0 MPa to 2 MPa)	CEOSTM, Georgia	CMI, Czechia, EURAMET	Approved CMCs published
COOMET.M.P-S5	Gauge pressure Pressure from 0 kPa to 34000 kPa	AzMI, Azerbaijan	CMI, Czechia, EURAMET	Approved CMCs published

COMPARISONS

Hardness

Identifier	Description	Pilot	Participants	Status
COOMET.M.H-S2	Bilateral comparison of national reference instruments for nanoindentation Martens hardness (0.1 GPa, 3 GPa and 12 GPa) Indentation hardness (0.2 GPa, 9 GPa and 23 GPa)	VNIIFTRI, Russia	PTB, Germany	Report in progress, draft A
COOMET.M.H-S3	Comparison of national hardness standards of Superficial-Rockwell scales Hardness: Superficial-Rockwell 90-94 HR15N, 40-50 HR30N, 76-84 HR30N, 43-54 HR45N, 45-55 HR30TW, 70-82 HR30TW	NSC "IM", Ukraine	BelGIM , Belarus KazStandard, Kazakhstan PTB, Germany CMI, Czechia	Report in progress, draft B
COOMET.M.H-S4	Brinell Hardness Hardness levels: 100 HBW, 200 HBW, 400 HBW	VNIIFTRI, Russia	NSC "IM", Ukraine BelGIM , Belarus KazStandard, Kazakhstan	Approved CMCs published (BelGIM)
COOMET.M.H-S5 (COOMET.M.H-K3 earlier)	Key comparison of national hardness standards of Rockwell scales Hardness: Rockwell A: 80 - 86 HRA; Rockwell B: 80 - 100HRBW; Rockwell C: 20 - 30 HRC, 40 - 50 HRC, 60 - 70 HRC. 25 HRC, 45 HRC, 65 HRC	NSC "IM", Ukraine	BelGIM , Belarus KazStandard, Kazakhstan PTB, Germany CMI, Czechia	Approved CMCs published (BelGIM)

COMPARISONS

Density

Identifier	Description	Pilot	Participants	Status
COOMET.M.D-S1	Density of liquids Liquid density: 750 kg/m^3, 757 kg/m^3, 761 kg/m^3, 890 kg/m^3, and 998 kg/m^3 Temperature range: 15 °C to 30 °C	VNIIM, Russia	AzMI, AZ, Azerbaijan KazStandard, Kazakhstan NMI(MD), Moldova	Report in progress, draft B

Volume

Identifier	Description	Pilot	Participants	Status
COOMET.M.FF-S7	Liquid volume Volume at 10 µL and 1000 µL	GEOSTM, Georgia	VNIIM, Russia NMI (MD), Moldova NSC "IM", Ukraine IMBIH, Bosnia and Herzegovina	Measurements in progress
COOMET.M.FF-S8	Liquid volume Volume at 0.5 µL to 10 µL; 10 µL to 100 µL; 100 µL to 1000 µL; 50 mL	GEOSTM, Georgia	IPQ, Portugal	Approved CMCs published
COOMET.M.FF-S6	Comparison of the determination of static volume of reference metallic tanks Volume of liquid: 5 L, 10 L and 20 L	NSC "IM", Ukraine	BelGIM, Belarus GEOSTM, Georgia INIMET, Cuba INM, Romania INSM, MD, Moldova KazStandard, Kazakhstan VNIIM, Russia	Measurements in progress

CCMs

NMI	Sub-field	Status
AzMI (Azerbaijan)	Mass	Published
AzMI (Azerbaijan)	Pressure	Published
BelGIM (Belarus)	Hardness	Published
Geostm (Georgia)	Pressure	Published
Geostm (Georgia)	Small Volume	Published
NSC IM (Ukraine)	Hardness	Under intra-regional review

WORKSHOPS & CONFERENCE

COOMET-PTB workshop on the volumes “piston pipettes” and “multidispensers”

22 - 26, July, 2019, Germany

Zentrum für Messen und Kalibrieren & ANALYTIK GmbH

Training schedule

for participants from COOMET

Consultancy concerning the development of Metrology
at the Calibration Laboratories of **ZMK**,
Germany
with focus on implementation of small volumes “piston pipettes” and “multi dispensers”

from 22nd to 26th July 2019

Date	Subject	Responsible
2019-07-22	- Arrival of the participants	
2019-07-23	**9.30 a.m.** - Opening meeting for the training - Introduction of training details - Discussion of the expectations of the participants - Definition of the 3 working groups (WG) for the practical training **10.30 a.m.** - Introduction into the theory of calibration of piston pipettes and hand dispensers according to DKD-R 8-1 (repetition) and DKD-R 8-2 ***Part 1*** **1.00 p.m.** - Practical training in the volume calibration laboratory on demand: *WG 1: Volumetric glassware* *WG 2: Pipette calibration* *WG 3: Preparation of the pipettes for calibration*	Dr. Barbara Werner Dr. Olaf Schnelle-Werner Dr. Ulrich Breuel Dr. Diana Jehnert Dipl.-Math. Nadine Schiering Dr. Ulrich Breuel Elke Winzer Sigrid Bastian
2019-07-24	**9.30 a.m.** - Clarification of open questions from the day before - Introduction into the theory of calibration of piston pipettes and hand dispensers according to DKD-R 8-1 (repetition) and DKD-R 8-2 ***Part 2*** - Introduction into the theory of calibration of volumetric glassware according to ISO 4787 (repetition) **01.00 p.m.** - Presentation: “Organization and participation in supplementary comparisons, roles and tasks of each participant” (Elsa Batista)	Dr. Olaf Schnelle-Werner Dr. Ulrich Breuel

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	- Presentation: “The COOMET requirements to the content of a technical protocol and a comparison report” (Iryna Kolozinska) - Preparation of a supplementary key comparison on the area of volume calibration (Creation of a working description, development of the technical protocol)	Dr. Olaf Schnelle-Werner Dr. Ulrich Breuel
2019-07-25	**9.30 a.m.** - Clarification of open questions from the day before **10.30 a.m.** - Continuation of the preparation of the supplementary key comparison on the area of volume calibration (Creation of a working description, development of the technical protocol)Training summary - Other topics of interest - ***Recommendations for next steps*** - Final discussion / Closing of the training at ZMK	Dr. Olaf Schnelle-Werner Dr. Ulrich Breuel Dr. Barbara Werner Dr. Olaf Schnelle-Werner Dr. Ulrich Breuel Dr. Diana Jehnert Dipl.-Math. Nadine Schiering
2019-07-26	- Departure of the participants	

The order of the topics to be discussed may be change depending on the current laboratory conditions and customer requirements.

Wolfen, 2019-07-09

Dr. O. Schnelle-Werner
Head of calibration laboratory D-K-15186-01

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EURAMET - COOMET training course on small volume comparisons

GEOSTM, Georgia, March, 2020 - postponed

Subject: Uncertainty budget and calculation for small volume

Planned: 2021 online

WORKSHOPS & CONFERENCE

27th International Conference on Vacuum Technique and Technology 2020

on October 27 – 29, 2020 (online)

Conference Sections:

Vacuum technique	Physics of vacuum. Getting a vacuum. Measurement of total and partial pressures. Design of elements of vacuum systems. Technological vacuum installations
Leakage control	Tightness of vacuum systems. Leak detection. Search and localization of defects in product. Gas flow measurements and leak quantification
Vacuum technology	Surface treatment. Creation of advanced materials and coatings (2D materials, nano-materials, films, heterostructures, etc.). Vacuum technology in industry and research

Organizers:

ВНИИМ 1842
VNIIM

COOMET TC–M 1.6

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Russian Vacuum Society

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Thank you for your attention!