



PROTOCOL
of the 27th Meeting of the COOMET Technical Committee
TC 1.6 Mass and Related Quantities

27 – 28 September 2023
D.I. Mendeleyev Institute for Metrology, St. Petersburg & online

The meeting was attended by 44 specialists from 11 COOMET Member States (Azerbaijan, Armenia, Belarus, Bosnia and Herzegovina, Kazakhstan, Kyrgyzstan, Cuba, Russia, Tajikistan, Turkey, and Uzbekistan). The list of participants is given in the Appendix A to this Protocol.

Quorum check

Specialists from 17 COOMET Member States have been appointed as Members of TC 1.6.

15 Member States determined the quorum (TC 1.6 Member from Bulgaria in an Observer; Ukraine's participation in COOMET was suspended at its own initiative).

Taking into account quorum requirements in accordance with COOMET D5/2021, quorum at the TC 1.6 meeting was ensured (quorum is ensured when representatives from 8 or more countries participate).

The meeting was chaired by Ilya Shmigelskiy (VNIIM, Russia), Chairperson of TC 1.6 "Mass and Related Quantities", in accordance with the consent Agenda.

Items of the Agenda, speakers, and the decisions made are listed below.

DECISIONS

1 On decisions of the COOMET Committee concerning activities of TC 1.6

Speaker: N. Lyakhova, former Head of the COOMET Secretariat

Decisions:

1. To take note of the information on the main decisions of the COOMET Committee, including those related to election and early taking the office of the new COOMET President, Gabit Mukhambetov (Kazakhstan), and appointment of the new head of the COOMET Secretariat, Ainur Rakhadinova (Kazakhstan);

2. To take note of the information on approval of the algorithm for possible actions to complete long-term comparisons;
3. To take note of the information on approval of the COOMET Concept on digital transformation in metrology.

2 Report on TC 1.6 activities in 2022 – 2023

Speaker: I. Shmigelskiy, Chairperson of COOMET TC 1.6

Decision:

1. To take note of the information on TC 1.6 activities in 2022 – 2023, including participation in 19th meeting of the BIPM, CMC review and other activities of TC 1.6.

3 On progress of work on the COOMET topics and on updating the Work Program

3.1.1 Topic 259/RU/02 (COOMET.M.F-S1) COOMET Comparisons in the field of force measurements

Participants: VNIIM (Pilot), BelGIM, Ukrmetrteststandart

Speaker: S. Semenov (VNIIM, Russia)

The Final Report B was completed.

Decisions:

1. To take note of the information provided by the Coordinator;
2. The Pilot is to send the Final Report B to the participants no later than October 10, 2023, involving the COOMET Secretariat if necessary;
3. To ask the Coordinator to update the topic in the KCDB, in particular, to include Ukrmetrteststandart as a participant;
4. After Final Report B is approved, to submit the Final Report on COOMET.M.F-S1 Supplementary Comparison for approval at the next meeting of TC 1.6 in 2024.

3.1.2 Topic 655/UA-a/15 (COOMET.M.M-S2) Bilateral supplementary comparison in the field of mass measurements

Participants: NSC "Institute of Metrology" (Pilot), NIM-MD

Speaker: V. Bogdanova (VNIIM, Russia)

The Pilot took the initiative to cease work on the topic. The participants are not interested in completion of the comparisons within COOMET.

Decisions:

1. To take note of the information provided by the speaker;
2. TC 1.6 Chairperson is to organize the procedure for excluding COOMET.M.M-S2 from the KCDB;
3. To exclude Topic 655/UA-a/15 from the COOMET Work Program at the initiative of the participants.

3.1.3 Topic 546/UA-a/11 (COOMET.M.M-S5) Supplementary comparison in the field of mass measurements

Participants: NSC "Institute of Metrology" (Pilot), BelGIM, INIMET, KazStandard, PTB, VMC, GeoSTM, UME

Speaker: V. Bogdanova (VNIIM, Russia)

The Pilot took the initiative to exclude this Topic from the COOMET Working Program, since both the Pilot and the participants are not interested in comparison results due to their duration.

Decisions:

1. To take note of the information provided by the speaker.
2. TC 1.6 Chairperson is to organize the procedure for excluding COOMET.M.M-S5 from the KCDB;
3. To exclude Topic 546/UA-a/11 from the COOMET Work Program at the initiative of the participants.

3.1.4 Topic 764/RU-a/18 (COOMET.M.M-S6) Supplementary comparison in the field of mass measurements (20 kg weight)

Participants: VNIIM (Pilot), BelGIM, GeoSTM, AzMI KazStandard, UzNIM, Kyrgyzstandart, UME

Speaker: V. Bogdanova (VNIIM, Russia)

In August 2023, a new form was approved due to VNIIM becoming the Pilot. The participants are: VNIIM (Russia), BelGIM (Belarus), KazStandard (Kazakhstan), UzNIM (Uzbekistan), Kyrgyzstandart (Kyrgyzstan), UME (Turkey). A new comparison schedule was presented and approved.

Decisions:

1. To take note of the information provided by the speaker;

2. To send the updated Technical Protocol to the participants no later than October 10, 2023;
3. To provide information on the progress of the comparison at the next TC 1.6 meeting.

3.1.5 Topic 694/MD-a/16 (COOMET.M.M-S3) Supplementary comparison in the field of mass measurements using transfer measurement standards with nominal mass of 100 mg, 20 g, 1 kg, and 10 kg

Participants: NIM-MD (Pilot), PTB, NIM-RO

Speaker: V. Bogdanova (VNIIM, Russia)

Since the previous meeting, the Pilot was asked to update the status of the comparison data, including via the COOMET Secretariat, but the Pilot did not provide the information. Before the meeting, NIM-MD informed that in 2019 the comparison status was changed to “pilot”.

Decisions:

1. To take note of the information provided by the speaker;
2. To ask the COOMET Secretariat to contact the Pilot (NIM-MD) to clarify the comparison status and prospects for its completion in connection with the comparison being included in the list of comparisons under the JCRB supervision.

3.1.6 Topic 822/GE/20 Pilot comparison of small volumes

Participants: GeoSTM (Pilot), KazStandard, TsSM (Kyrgyzstan), UzNIM, AzMI, State Reference Center (Turkmenistan)

The Pilot did not participate in the meeting.

Decisions:

1. To ask the Pilot to submit information on the progress of the comparison to the TC 1.6 Chairperson no later than November 1, 2023;
2. To present the information on the progress of the comparison at the next TC 1.6 meeting.

3.1.7 Topic 766/GE-a/18 (COOMET.M.FF-S7) Supplementary comparison of small volumes

Participants: GeoSTM (Pilot), INM-MD, NSC "Institute of Metrology", VNIIM, IMBIH

The Pilot did not participate in the meeting.

Decisions:

1. To ask the Pilot to submit information on the progress of the comparison to the TC 1.6 Chairperson no later than November 1, 2023;
2. After approval of Report B by the participants, to submit the final report for approval at the next TC 1.6 meeting.

3.1.8 Topic 789/KZ-a/19 Pilot comparison of density of liquids in the range from 600 to 1000 kg/m³

Participants: KazStandard (Pilot), UzNIM

3.1.9 Topic 788/KZ-a/19 Pilot comparison of unit of kinematic viscosity of liquid at the temperatures: 20 °C (250 – 400 mm²/s), 25 °C (50 – 100 mm²/s), 40 °C (20 – 70 mm²/s)

Participants: KazStandard (Pilot), UzNIM

Speaker: A. Duskazieva (KazStandard, Kazakhstan)

Measurements are completed. The Coordinator is preparing Reports A (expected to be completed by the end of 2023).

Decisions:

1. To take note of the information provided by the Coordinator;
2. To submit the information on the progress of the comparison at the next TC 1.6 meeting.

3.1.10 Topic 651/RU-a/14 (COOMET.M.H-S2) Supplementary bilateral comparison of National Measurement Standards in the field of nanoindentation

Participants: VNIIFTRI (Pilot), PTB

Speaker: A. Aslanyan (VNIIFTRI, Russia)

Measurements are completed. The Coordinator is preparing Draft Report A. It is expected to be approved by December 2023.

Decisions:

1. To take note of the information provided by the Coordinator;
2. After approval of Report B by the participants, to submit the final report for approval at the next TC 1.6 meeting (preferably in 2024).

3.1.11 Topic 711/TR-a/16 (KC COOMET.M.P-K15) Comparison of absolute pressure in the range from 0.3 mPa to 0.9 Pa

Participants: UME (Pilot), VNIIM

Speaker: Gökçe Sevim (UME, Turkey), A. Chernyshenko (VNIIM, Russia)

Final Report B was approved by the participants and CCM, and was published in the KCDB.

Decisions:

1. To take note of the information provided by the Speakers;
2. To ask the Pilot to submit the Final Report form to the COOMET Secretariat.

3.1.12 Topic 717/DE-a/17 (COOMET.M.P-S3) Supplementary comparison of National Measurement Standards of pressure in the range from 250 MPa to 1500 MPa

Participants: PTB, VNIIFTRI

Speaker: S. Gavrilkin (VNIIFTRI, Russia)

Measurements are completed. The Coordinator is preparing Draft Report A. It is expected to be approved by the participants in December 2023.

Decisions:

1. To take note of the information provided by the Speaker;
2. After approval of Report B by the participants, to submit the final report for approval at the next TC 1.6 meeting (preferably in 2024).

3.1.13 Topic 589/UA-a/12 (COOMET.M.P-S1) Supplementary comparison of National Measurement Standards of manometric pressure in the range from 1 MPa to 10 MPa

Participants: NSC "Institute of Metrology" (Pilot), VNIIM, BelGIM, VMC

Speaker: A. Chernyshenko (VNIIM, Russia)

Report B is prepared and approved by the participants. At the stage of approval by CCM, comments from reviewers were received. Comments are being discussed with the experts.

Decisions:

1. To take note of the information provided by the Coordinator;

2. After approval of Report B by the CCM, to ask the Pilot to complete the COOMET topic in the prescribed manner (and to submit the final report form to the COOMET Secretariat).

3.2 On proposals from TC 1.6 Members regarding organization of comparisons

3.3 On CEEMS proposals regarding organization of comparisons to include them in the COOMET Assistance Program for CEEMS for 2023 – 2025

During the meeting, issues on proposed comparison topics from the Agenda were combined with proposals of CEEMS countries on organizing comparisons.

Proposals from Armenia, Kyrgyzstan, Tajikistan, and Uzbekistan to organize comparisons at accuracy levels that meet the CEEMS needs were discussed in detail.

The adopted decisions on CEEMS comparisons are listed in Appendix B (extract from the COOMET Assistance Program for CEEMS for 2023 – 2025). Other proposals are listed in Decisions below.

Decisions:

1. To approve carrying out comparisons initiated by the CEEMS, listed in the Appendix B (for decisions and necessary actions see Appendix B); to note that other interested COOMET Member Countries can join these comparisons;
2. To approve the proposal of UNIIM – Branch of the D.I. Mendeleyev Institute for Metrology (UNIIM, Russia) to organize a Pilot Comparison in the field of torque measurements in the range from 0.1 to 1 N·m; to ask UNIIM to draw up a form for the proposed COOMET topic in the prescribed manner no later than the end of 2023 for the following identification of participants; to consider the issue of preparation for the comparisons at the next TC 1.6 meeting.

4 Discussion of the results of the analysis on possibility and necessity of applying the plan of action to conclude the long-lasting COOMET comparisons

Speaker: I. Shmigelsky (VNIIM, Russia)

During the meeting, the participants were acquainted with the plan of action to conclude the long-lasting COOMET comparisons, approved by the COOMET Committee.

Discussion of its provisions was carried out under item 3.1 of the Agenda in relation to specific comparisons.

Decisions:

1. To take note of the information provided by the speaker;
2. TC 1.6 Secretary is to forward the plan of action to conclude the long-lasting COOMET comparisons to TC 1.6 participants to use as guidelines in their work.

5 On issues related to the implementation of the CIPM MRA

Speaker: I. Shmigelsky (VNIIM, Russia)

During the meeting, the participants were provided with information on CMC review. Since the 26th TC 1.6 meeting, 21 CMCs were reviewed, of which 17 were approved, and 4 were not approved.

Decisions:

1. To take note of the information provided by the speaker;
2. To include Leonid Vitushkin (VNIIM, Russia), gravimetry measurements, and Marat Yunusov (UzNIM, Uzbekistan), pressure measurements, into the list of COOMET experts on CMC review; to ask TC 1.6 members to send to the TC 1.6 Chairperson additional proposals on including specialists from the NMI of their countries to the list of COOMET Technical Experts by November 1, 2023.

6 On the decisions of the 23rd and 24th meetings of the COOMET Joint Committee on Measuring Standards (JCMS). On the issues related to the decisions taken

Speaker: N. Zviagin (VNIIM, Russia)

The participants were informed about the decisions of the 23rd and 24th meetings of the COOMET JCMS.

Decision:

1. To take note of the information provided by the speaker.

6.1 Implementation of the COOMET P6/2021 “COOMET Roadmap on implementation of the decisions related to the redefinition of the SI for 2020 – 2025” (in terms of kilogram) and the need to update it

Speaker: I. Shmigelsky (VNIIM, Russia)

The participants were acquainted with the COOMET P6/2021 actions in the TC 1.6 area of responsibility.

Decisions:

1. To take note of the information on implementation of the COOMET P6/2021 provided by the speaker;
2. To request to exclude item A.1.2 (Supplementary comparison in the field of calibration of weights of the E2 accuracy class; measurement interval: from 1 mg to 20 kg (nominal values: 10 mg, 500 mg, 5 g, 10 g, 100 g and 5 kg)) from the COOMET P6/2021 due to the lack of interest in carrying them out from TC 1.6 members. TC 1.6 Chairperson to inform the JCMS about this decision.

6.2 On feasibility of developing primary reference measurement techniques and reference measurement techniques in the field of Mass and Related Quantities

Speaker: I. Shmigelsky (VNIIM, Russia)

This issue was brought up at the 26th TC 1.6 meeting; no requests for development were received. A brief discussion was held which resulted in the participants deeming it inexpedient to develop primary reference measurement techniques and reference measurement techniques in the field of Mass and Related Quantities.

Decision:

1. To note the inexpediency to develop primary reference measurement techniques and reference measurement techniques in the field of Mass and Related Quantities. TC 1.6 Chairperson – to inform the JCMS about this decision.

6.3 On necessity of organizing comparisons for measuring standards of Russia and Belarus, which have not previously taken part in comparisons

Speaker: I. Shmigelsky (VNIIM, Russia)

The participants were informed about the EACS STCMetr initiative to organize such comparisons. It was noted, that some Russian measuring standards from the list prepared by the STCMetr took part in the CIPM and CIPM CCs key comparisons, therefore comparisons within COOMET are redundant.

Decisions:

1. To take note of the information provided by the speaker;
2. To put together a list of measuring standards of Russia and Belarus in the field of Mass and Related Quantities, which have not previously taken part

in any COOMET comparisons and which require them for publication or approval of CMC, and to distribute that list to the TC 1.6 members in search of interested parties. To ask the TC 1.6 members to report their interest to the TC 1.6 Secretariat by the end of December;

3. If there are parties that are interested, TC 1.6 Chairperson to organize preparation of the forms for proposed COOMET topics in the course of work;
4. To discuss the issue of organizing comparisons of measuring standards of Russia and Belarus at the next TC 1.6 meeting in 2024.

7 Organizational issues

Under the items 7.1 – 7.4 of the Agenda, elections were held for the Chairpersons of SC 1.6.3 “Pressure”, SC 1.6.4 “Hardness”, SC 1.6.5 “Density and Viscosity”, as well as for the Coordinator for the activity area “Gravimetry”.

The TC 1.6 Chairperson nominated the following candidates:

- Roman Teteruk (VNIIM, Russia) for the position of the Chairperson of SC 1.6.3 “Pressure”,
- Andrey Aslanyan (VNIIFTRI, Russia) for the position of the Chairperson of SC 1.6.4 “Hardness” (for the second term of office),
- Anastasia Neklyudova (VNIIM, Russia) for the position of the Chairperson of SC 1.6.5 “Density and Viscosity”,
- Leonid Vitushkin (VNIIM, Russia) for the position of the Coordinator for the are of the activity area “Gravimetry”.

No other candidates were proposed during the TC 1.6 meeting.

According to item 5.2.3.2 of the COOMET D5/2021 “Model regulations for COOMET Structural Bodies”:

Elections of the Chairperson of a COOMET Structural Body are help in the form of a closed vote among the members of the COOMET Structural Body at a meeting of the COOMET Structural Body.

The decision is considered adopted if 2/3 of votes are cast FOR the candidate (if there's only one candidate), or if by the majority of votes (if there are two or more candidates) from the members of the COOMET Structural Body who took part in the voting.

According to item 5.2.4.4 of the COOMET D5/2021:

Elections of the SC Chairperson are carried out in the manner established by the COOMET Structural Body. It is recommended to conduct voting among the TC

and/or SC members using modern means of communication (email, the Internet, etc.).

According to item 5.2.4.5 of the COOMET D5/2021:

COOMET Structural Bodies can appoint Coordinators for activity areas. The Coordinators are appointed for 5 years (the decision is taken at a meeting of the COOMET Structural Body in the manner established by the COOMET Structural Body). The term of office of the Coordinators may be extended by decision of the COOMET President's Council on the proposal of the Chairperson of the COOMET Structural Body.

A closed vote took place among the TC 1.6 members using Zoom's "Polls" function. Ten TC 1.6 members or their representatives took part in the voting.

VOTING RESULTS

- 1 One candidate was listed in the electronic voting ballot for election of the Chairperson of SC 1.6.3 "Pressure" for 2024 – 2028 (with the possibility of a one-time extension of the term of office for 4 years) – **Roman Teteruk (VNIIM, Russia)**.

Votes cast – 10 (FOR – 10, AGAINST – 0, ABSTAINED – 0).

The election is considered valid.

- 2 One candidate was listed in the electronic voting ballot for election of the Chairperson of SC 1.6.4 "Hardness" for 2024 – 2028 (the term of office can not be extended) – **Andrey Aslanyan (VNIIFTRI, Russia)**.

Votes cast – 10 (FOR – 9, AGAINST – 0, ABSTAINED – 1).

The election is considered valid.

- 3 One candidate was listed in the electronic voting ballot for election of the Chairperson of SC 1.6.5 "Density and Viscosity" for 2024 – 2028 (with the possibility of a one-time extension of the term of office for 4 years) – **Anastasia Neklyudova (VNIIM, Russia)**.

Votes cast – 10 (FOR – 10, AGAINST – 0, ABSTAINED – 0).

The election is considered valid.

The results of voting on items 1 – 3 will be further submitted for approval to the COOMET President's Council and COOMET Committee.

- 4 One candidate was listed in the electronic voting ballot for election of the Coordinator of the activity area "Gravimetry" for 2024 – 2029 (with the possibility of extension of the term of office) – **Leonid Vitushkin (VNIIM, Russia)**.

Votes cast – 10 (FOR – 10, AGAINST – 0, ABSTAINED – 0).

The election is considered valid.

The results of voting on item 4 will be further submitted for approval to the COOMET President's Council.

The participants of the meeting wished the elected Chairpersons SC 1.6.3 – SC 1.6.5 and the Coordinator of the “Gravimetry” activity area success in fulfilling their duties.

On behalf of TC 1.6, gratitude was expressed to the current SC 1.6.3 Chairperson Alexander Chernyshenko and the current SC 1.6.5 Chairperson Alexey Demyanov for their contribution to organization of COOMET works in the field of Mass and Related Quantities: they continue to perform their duties until the meeting of the COOMET Committee in 2024.

Under the item 7.5 of the Agenda, the TC 1.6 Chairperson informed the participants about the appointment of Viktor Chechel (VNIIM, Russia) as the TC 1.6 Secretary.

Under the item 7.6 of the Agenda, the TC 1.6 Chairperson drew attention of the TC 1.6 members to the need to update compositions of all the subcommittees.

Decisions:

1. TC 1.6 Chairperson to inform the COOMET Secretariat on the results of the election of SC 1.6.3 – SC 1.6.5 Chairpersons and the Coordinator for activity area “Gravimetry” (for the further review by the COOMET President's Council);
 2. To appoint Leonid Vitushkin (VNIIM, Russia) as the Coordinator of the activity area “Gravimetry”;
 3. To take note of the information on appointing Viktor Chechel (VNIIM, Russia) as the TC 1.6 Secretary;
 4. To ask TC 1.6 members to confirm the representatives of their countries in SC 1.6.3 – SC 1.6.5; nominations for the SC members to submit to the TC 1.6 Secretary by the end of december 2023.
- 8 On feasibility of combining TC 1.6 with TC 1.4 on the KCDB platform and in the organizational structure of the COOMET. On the status of the activity area “Small Volumes”**

Speaker: I. Shmigelsky (VNIIM, Russia), R. Korneev (VNIIR)

TC 1.6 Chairperson proposed to merge TC 1.4 “Flow Measurement” and TC 1.6 “Mass and Related Quantities”, with TC 1.4 becoming a subcommittee of TC 1.6. TC 1.4 Chairperson R. Korneev supported the proposal.

After the discussion, CT 1.6 members approved this initiative.

It was also proposed to clarify the name of the activity area “Small Volumes” and to change it to “Small Static Volume of Liquid”.

Decisions:

1. To discuss the of merging TC 1.4 “Flow Measurement” and TC 1.6 “Mass and Related Quantities” at the TC 1.4 meeting;
2. In case of positive decision, to ask TC 1.4 to discuss possible candidates for subcommittee (s) Chairperson(s) and/or Coordinator(s) for activity areas in the filed of flow measurements;
3. To change the name of activity area “Small Volumes” to “Small Static Volume of Liquid”;
4. In case of positive decision of TC 1.4, TC 1.6 Chairperson to initiate consideration of changing the organizational structure of COOMET at the JCMS meeting (Jctober 26, 2023), and to formally petition for this proposal to the COOMET President’s Council no later that November 1, 2023.

9 On updating COOMET D5.9/2012 “Regulation of the COOMET Technical Committee “Mass and Related Quantities” (TC 1.6)”

Speaker: I. Shmigelsky (VNIIM, Russia)

Decisions:

1. TC 1.6 Chairperson to organize preparation of the updated version of COOMET D5.9/2012 “Regulation of the COOMET Technical Committee “Mass and Related Quantities” (TC 1.6)” (taking into account Decisions on item 8) no later than October 25, 2023;
2. To submit the updated version of COOMET D5.9 to TC 1.6 members for consideration and carry out an electronic vote for its approval by November 15, 2023; to submit the final version to the COOMET Secretariat for consideration by the President’s Council.

10 On feasibility of translating calibration guides (EURAMET and PTB/DKD) of interest to the COOMET member countries (subject to obtaining permission for translation from the owner)

Decisions:

1. TC 1.6 Secretary to conduct a survey of TC 1.6 members on feasibility of translating calibration guides (EURAMET and PTB/DKD) by December 1, 2023;
2. To submit the survey results at the next TC 1.6 meeting in 2024; to discuss the need to establish COOMET topics on translating calibration guides and possible Coordinators for this work.

11 On functioning of the BIPM e-learning platform and on creation of COOMET training courses in the TC 1.6 area of responsibility

Speaker: N. Lyakhova, former Head of COOMET Secretariat

The BIPM e-learning platform hosts various training courses (see <https://e-learning.bipm.org/>). Currently the COOMET section has 4 courses.

The COOMET Committee recommended that in 2023 each COOMET Structural Body develops and posts at least one training course in the COOMET section on topics that are in the area of their responsibility.

Decisions:

1. To take note of the information provided by the speaker;
2. TC 1.6 Chairperson to organize in the course of work development of a COOMET training course in the area of TC 1.6 responsibility; if necessary, to organize online working meeting for interested participants. To inform the JCMS and COOMET Secretariat on the preliminary results no later than November 15, 2023.

12 Brief reports on the current activities in the field of Mass and Related Quantities in COOMET member countries

12.1 Presentation of UME about realization of kibble balance

Speaker: Hacı Ahmedov (UME, Turkey)

Decision:

1. To take note of the information provided by the speaker.

13 On date and place of the next TC 1.6 meeting

Decisions:

1. To hold the next TC 1.6 meeting on September 25–27, 2024;
2. To hold the COOMET Seminar “Status of Redefinition of Kilogram and Progress in Primary Realizations”, required by the COOMET P6/2023, together with the TC 1.6 meeting;
3. To inform TC 1.6 members on the exact time, place, and format of the meeting no later than June 15, 2024.

Chairman of TC 1.6 COOMET

Ilya SHMIGELSKIY