ANNUAL REPORT
COOMET TC 1.6 "Mass and Related Quantities" for 2021

1. GENERAL CHARACTERISTICS OF COOPERATION, including information on the list of works and/or projects performed and on the participants of cooperation, as well as problems and prospects for the development of cooperation in the field "Mass and Related Quantities";

1.1 General characteristics of cooperation in this subject field

COOMET TC 1.6 includes representatives of 18 COOMET member countries: Azerbaijan, Armenia, Belarus, Bulgaria, Bosnia and Herzegovina, Germany, Georgia, Kazakhstan, Kyrgyzstan, Cuba, Lithuania, Moldova, Russia, Slovakia, Tajikistan, Turkey, Uzbekistan and Ukraine.

The main task of the TC is to implement the cooperation of COOMET member countries in the field of "Mass and Related Quantities", including such areas of activity as:

- organization of key and supplementary comparisons of national measurement standards of COOMET member countries in support of CMCs, which are currently submitted or will be submitted in the near future by COOMET member countries;
- preparation and regional review of data on calibration and measurement capabilities (CMC) of COOMET member countries;
- cooperation with the relevant technical committees of other regional metrology organizations, participation in interregional review of CMC of those RMOs.

There are the following subcommittees within TC 1.6:

- SC 1.6.1 "Mass" (Chair – Mrs. Irina Kolozinskaya, NSC "IM", Ukraine);
- SC 1.6.2 "Force" (Chair – Mr. Aleksandr Tsiporenko, Ukrmetrteststandart, Ukraine);
- SC 1.6.3 "Pressure" (Chair – Mr. Aleksandr Chernyshenko, VNIIM, Russia);
- SC 1.6.4 "Hardness" (Chair – Mr. Andrey Aslanyan, VNIIFTRI, Russia);
- SC 1.6.5 "Density, Viscosity" (Chair – Mr. Aleksey Demianov, VNIIM, Russia).

1.2 Information about the list of works and/or projects performed and about the participants of cooperation

Information on the list of works and/or projects performed is given in Table 1.

Table 1

Project number	Project title	Participants	Problems related to the organization and conduct of comparisons
789/KZ-a/19	Pilot comparisons in liquid density in the range from 600 to 1000 kg/m3	KazStandard, UzNIM	No
788/KZ-a/19	Pilot comparisons of the unit of kinematic viscosity of a liquid at temperatures: 20 °C (250-400 mm^2/s), 25 °C (50-100 mm^2/s), 40 °C (20-70 mm^2/s)	KazStandard, UzNIM	No
651/RU-a/14	Additional bilateral comparisons of national standards in the field of nanoindentation	VNIIFTRI, PTB	Delay in the processing of measurement results by the pilot
665/UA-a/15	Bilateral supplementary comparisons by mass	NSC "Institute of Metrology", INM-MD	No
546/UA-a/11	Supplementary comparison in the field of mass measurement	BelGIM, INIMET, KazStandard, NSC IM, PTB, VNIIM, VMC, GeoSTM, UME	No

694/MD-a/16	Additional comparisons in the field of mass measurement using reference standards with a nominal mass of 100 mg, 20 g, 1 kg and 10 kg	INM-MD, PTB, NIM-RO	No
711/TR-a/16	Absolute pressure comparisons in the range from 0.3 MPa to 0.9 Pa	VNIIM, UME	No
766/GE-a/18	Additional comparison of small volumes	GEOSTM; INM-MD; NSC "IM"; VNIIM; IMBIH	No
717/DE-a/17	Supplementary comparisons of national pressure unit standards in the range from 250 MPa to 1500 MPa	PTB, VNIIFTRI	No
638/UA-a/14	Comparison of national hardness standards on the Super-Rockwell scale	NSC "Institute of Metrology", PTB, "KazStandard", CMI (Czech Republic), BelGIM	No
589/UA-a/12	Additional comparison of national gauge pressure standards in the range from 1 MPa to 10 MPa	NSC IM, VNIIM, BelGIM, KazStandart, INIMET, VMT/VMC, INM-MD	No
560/UA-a/12	Comparison of National Standards of Hardness on Rockwell and Super-Rockwell Scales	NSC IM, PTB, KazStandard, CMI (Czech Republic), BelGIM	No
259/RU/02	COOMET comparisons in the field of force measurements	VNIIM, BelGIM, Ukrmetrteststandart	No
737/UA/17	Bilateral comparison of national force standards	Ukrmetrteststandart, PTB	Delayed

2. RESULTS OF RECENT MEETINGS OF TC 1.6 AND ITS SUBORDINATE SCS

No meetings were held in 2021.

Members of the TC were informed about:

- resolutions of the 30th COOMET Committee meeting;
- activities provided for in the COOMET Strategy for 2020-2025 and COOMET Development Program for 2020-2022;
- information about the meetings of the Joint Committee for Measurement Standards (JCMS);
- COOMET Roadmap for the implementation of decisions related to the redefinition of the basic units of the International System of Units SI, in particular the kilogram;
- implementation of the Plan for Cooperation between COOMET and EURAMET;
- work of the TC for the period since the previous meeting;
- progress in the implementation of the current projects carried out within the TC;
- other issues affecting the activities of the TC (including update of the Regulation on the TC, holding of training seminars and internships, etc.).

3. RESULTS OF THE IMPLEMENTATION OF THE COOMET STRATEGY AND COOMET DEVELOPMENT PROGRAM (concerning the activities of TC 1.6), AS WELL AS TC 1.6 WORK PROGRAM

TC members took part in the implementation of a number of activities provided for in the COOMET Development Program for 2020-2022 and Roadmap for the implementation of the COOMET Strategy for 2020-2025, namely:

• 9. (Ind-a.1.9) Carrying out of an analysis of the timeframe for conducting COOMET comparisons and taking corrective actions for its reduction: work was carried out on the official completion of comparisons in the KCDB performed under the auspices of TC 1.6;

• 19. (Ind-a.4.1) Preparation and implementation of a Roadmap for TC 1.2 – TC 1.11 for the implementation of decisions related to the redefinition of the SI base units; work is being performed on the planned activities within the area of responsibility of TC 1.6;

No other proposals on the COOMET Development Program (concerning the activities of TC 1.6) were received from TC members.

It was proposed to supplement the Work Program of TC 1.6 with the project *Pilot comparisons of small volumes*, which has been registered to date under number 822/GE/20. Participants of the project: GeoSTM (Georgia), KazStandard (Kazakhstan), CSM (Kyrgyzstan), UzNIM (Uzbekistan), AZMI (Azerbaijan), State Etalon Center (Turkmenistan).

4. REVIEW OF COMPLETED PROJECTS AND INFORMATION ON THE USE OF THE OBTAINED RESULTS

In 2021 there were no projects that changed their status to "Completed".

5. ISSUES OF INTERACTION WITH INTERNATIONAL AND REGIONAL ORGANIZATIONS IN THIS FIELD OF COOPERATION;

The international seminar "Processing of measurement results and calculation of uncertainty for comparisons in the field of small volumes" was held on September 18-19, 2021. The seminar was held within the framework of cooperation between COOMET and EURAMET. Representatives of 4 regional metrology organizations took part in the seminar.

6. WORK ON PARTICIPATION IN THE IMPLEMENTATION OF INTERNATIONAL AGREEMENTS (FOR EXAMPLE, THE CIPM MRA, ETC.)

Technical experts of the TC took part in the interregional review of CMC entries in the field of mass, force, torque, pressure and static volume. In total, more than 40 entries were reviewed.

In 2021, the entries of KazStandard (Kazakhstan) and BelGIM (Belarus) in the field of hardness were published.

The lists of COOMET technical experts on CMC review and COOMET technical experts on peer review of the QMS of NMIs/DIs within the area of responsibility of TC 1.6 were updated.

TC members took part in the webinar "The practice of implementation of the documents of the CIPM MRA and COOMET publications on carrying out and evaluation of results of calibration and comparison" (15 October 2021).

7. INFORMATION ON THE EXPECTED VENUE AND DATE OF THE NEXT MEETINGS OF TC 1.6 AND ITS SUBORDINATE PCS

It is planned to hold the next meeting of the TC in September 2022 at the premises of UzNIM, Uzbekistan, off-line. The final decision on the timing and form of the meeting will be made depending on the situation.

TC 1.6 Chair
Irena Kolozinska