ANNUAL REPORT
Chair of TC 1.6 “Mass and related quantities”
for 2019

1. GENERAL CHARACTERISTIC OF COOPERATION ACCORDING TO THEME AREA, INCLUDING INFORMATION ABOUT THE LIST OF WORKS PERFORMED AND / OR THEMES AND ON PARTICIPANTS OF COOPERATION

During the reporting period, the topics “Mass and related quantities” were conducted on 40 COOMET projects (irrelevant - 4, completed - 7, comparisons -38; trainings, consultation, development of guidelines- 3):

Ref. №	Subject	Subject Field	Project's state
758/CU/18	Supplementary bilateral comparison in the field of mass with the aim of detailed values of uncertainty for CMC-entry	**Mass**	Prepared by Technical Protocol
773/UA/19	Supplementary bilateral comparisons in the field of sub-milligram mass measurement	**Mass**	Measurements in progress
764/UA/18	Supplementary comparisons in the field of mass measurements	**Mass**	Technical Protocol in preparation
548/UA/11	Supplementary bilateral comparisons of submultiply and multiply units of kilogram	**Mass**	Measurements in progress
665/UA-a/15	Supplementary bilateral comparison in the field of mass measurements	**Mass**	Draft A
546/UA-a/11	Supplementary comparisons in the field of mass measurements	**Mass**	In progress
694/MD-a/16	Supplementary comparison of mass standards with nominal values of 100 mg, 20 g, 1 kg and 10 kg	**Mass**	Draft B
726/UZ-a/17	Comparison of stainless steel mass standards	**Mass**	In progress
737/UA/17	Bilateral comparison of national force standards	**Force**	In progress
718/GE/17	Bilateral supplementary comparison in the absolute pressure range from 0 MPa to 7 MPa and gauge pressure range from 0 MPa to 2 Mpa	**Pressure**	Draft B on approval by CCM
717/RU/17	Supplementary comparison of national reference instruments of the pressure unit in the range from 250 MPa to 1500 MPa.	**Pressure**	In progress
712/TR-a/16	Comparison of absolute pressure in the range 0,03 Pa to 13 Pa	**Pressure**	Report preparation (draft A)
711/TR-a/16	Comparison of absolute pressure in the range 0,3 mPa to 0,9 Pa	**Pressure**	Report preparation (draft A)
589/UA-a/12	Supplementary comparison of national measurement standards of gauge pressure in the range from 1 MPa to 10 MPa	**Pressure**	Measurements in progress
341/RU/05	Key comparison of Brinell and Vickers hardness scales	**Hardness**	Draft B on approval by CCM

Ref. №	Subject	Subject Field	Project's state
651/RU-a/14	Supplementary bilateral comparison of national reference instruments for nanoindentation	**Hardness**	Measurements in progress
638/UA-a/14	The comparison of the national hardness standards of Super-Rockwell scales.	**Hardness**	Report preparation (draft A)
560/UA-a/12	The comparison of the national hardness standards of Rockwell and Super-Rockwell scales.	**Hardness**	Report on approval by CCM
788/UZ/19	Pilot comparison of the unit kinematic viscosity of a liquid at temperatures 20 °C (250-400 mm2/s), 25 °C (50-100 mm2/s), 40 °C (20-70 mm2/s), 60 °C (5-20 mm2/s)	**Viscosity**	In progress
789/UZ/19	Pilot comparisons of fluid density in the range of from 600 to 1000 kg/m^3	**Density/ volume**	In progress
769/UA/18	Supplementary bilateral comparisons in the field of small volume	**Density/ volume**	In progress
766/GE/18	Supplementary comparison in the small volumes	**Density/ volume**	In progress
762/UA/18	Supplementary comparisons in the field of the determination of density (volume) of solid body (weights)	**Density/ volume**	In progress
719/GE/17	Bilateral supplementary comparison in the Small Volumes range from 10μL to 100μL	**Density/ volume**	In progress
545/UA-a/11	Comparisons of complex of static volume measuring devices	**Density/ volume**	Measurements in progress
767/GE-a/18	Bilateral supplementary comparison in the small volumes	**Density/ volume**	Report on approval by CCM
555/AZ-a/12	Supplementary COOMET comparisons in the field of density measurements	**Density/ volume**	Report preparation (draft A)

2 RESULTS OF THE LAST MEETINGS OF SOC AND SUBSIDIED TO THEM PC/TC

The results of the last SOK meeting in the form of a decision of the TC 1.6 meeting are given below:

2.1. To take into account the participants' reports on the state of affairs in the field of measurements “Mass and quantities associated with it” in COOMET member countries.

2.2 To recognize the success of the activities of TC 1.6 in terms of the implementation of topics and the examination of CMC

2.3a. To appoint the chairman of SC 1.6.4 Hardness - A. Aslyanyan, VNIIFTRI.

2.3b. To re-elect the chairmen of SC 1.6.1 Mass (Kolozinskaya I.), SC 1.6.2 Force (Leonov G.), SC 1.6.3 Pressure (Chernyshenko A.), SC 1.6.5 Density, viscosity (A. Demyanov) for the next term.

2.4. Update the status of projects in the COOMET and BIPM databases.

2.5. Proposals on new projects in the field of mass and related quantities, which were agreed during the meeting, should be formulated as proposed projects and sent to the chairperson of TC 1.6 to organize their further registration in the COOMET database.

2.6. To agree the results of projects 711 / TR / 16 - COOMET.M.P.K15 / 712 / TR / 16 - COOMET.M.P-S2, 694 / MD-a / 16.

2.7. Hold the 25th meeting of TC 1.6 in Geostm, Georgia, in September 2020.

3 REVIEW OF COMPLETED PROJECTS AND INFORMATION ON THE USE OF THE RECEIVED RESULTS

An overview of the completed projects and information on the use of the results is shown in the table below:

Ref. №	Subject	THE RECEIVED RESULTS
722/AZ/17	Bilateral supplementary comparison of mass standards with nominal values of 100 mg, 2 g, 20 g, 500 g, 5 kg of accuracy class E2	The report is published in the Technical Appendix to the Metrology, prepared CMC are under review
515/UA-a/11	Bilateral comparisons of primary standards of unit of force	The report is published in the Technical Appendix to the Metrology, CMC are published
671/GE/15	Calibration of mass standards (weights)	Calibration guidelines provided to TC participants
670/GE/15	Comparisons of weight standards with a nominal value of 100 mg, 5 g, 50 g and 1 kg	The report is published in the Technical Appendix to the Metrology, CMC are published
614/KG/13	Development of guidelines for the theoretical foundations of calculating mass uncertainty, conditional mass and their uncertainties in the calibration / calibration of weights	Calibration guidelines provided to TC participants
528/KZ/11	Pilot comparisons of multiple and fractional units of a kilogram	The results were discussed at the TC 1.6 meeting
723/AZ/17	Bilateral supplementary comparison in the range of overpressure from 0 MPa to 34 MPa	The report is published in the Technical Appendix to the Metrology, CMC are published

4 ISSUES OF INTERACTION WITH INTERNATIONAL AND REGIONAL ORGANIZATIONS IN THIS AREA OF COOPERATION

TC 1.6 COOMET actively cooperates with the CCM BIPM, participating in Working Groups CCM by mass, hardness and pressure. TC 1.6 COOMET actively collaborates with a similar technical committee of EURAMET, as well as in EMPIR projects/.

TC 1.6 COOMET members participate in such key comparisons performimg by CCM:

CCM.H-K1 Key comparisons in Brinell hardness;
CCM.D-K3 Key comparisons in the field of solid body density measurements;
CCM.F-K3 Key comparisons in force in the range of 0.5-1 MN;
CCM.M-K7 Key comparisons of multiple and sub-multiply units of kilogram.
CCM.V-K4 Key comparisons in the field of viscosity on newton liquids.

Members of TC 1.6 participate in conferences of IMEKO working groups and seminars:

- "Redefinition of the International System of Units (SI)", VNIIM them. DI. Mendeleev, St. Petersburg, Russia (October 2019);
- BIPM Training on KCDB 2.0 as part of the CBKT BIPM Program, BIPM, November 2019.

5 WORKS TO PARTICIPATE IN THE IMPLEMENTATION OF INTERNATIONAL AGREEMENTS (FOR example, AGREEMENTS ON MUTUAL RECOGNITION OF NATIONAL STANDARDS AND CALIBRATION CERTIFICATES AND MEASUREMENTS ISSUED BY NATIONAL INSTITUTES)

During the reporting period, the following CMC were reviewed:

Country	Sub-area	Code	Status
GeoSTM, Georgia	Mass	-	Under discussion
GeoSTM, Georgia	Pressure	-	Agreed
AzMI, Azerbaijan Republic	Mass	COOMET.M.33.2018	Under inter-regional review
AzMI, Azerbaijan Republic	Pressure	COOMET.M.32.2018	Under inter-regional review

Participation of COOMET in the inter-regional expertise of CMC:

Code	**Sub-area**	**State**
AFRIMETS.M.7.2019	mass	Reviewed
APMP.M.48.2019	pressure	Reviewed
APMP.M.49.2019	Mass, torque	Reviewed
APMP.M.51.2019	mass	Reviewed
EURAMET.M.63.2019	gravity	Reviewed
EURAMET.M.64.2019	pressure	Reviewed
SIM.M.41.2019	volume	Reviewed

6 INFORMATION ON THE PROPOSED PLACE AND DATE OF THE NEXT MEETINGS OF JUICES AND SUBJECTS THERE OF PC/TC

See paragraph 2 of this report.

7 PROPOSALS FOR RESOLUTIONS OF THE MEETING OF THE COOMET COMMITTEE

None

Irina Kolozinskaya
Chair of TC COOMET 1.6