

	COOMET RECOMMENDATION	COOMET R/RM/16:2007
	Recommendation for the acceptance of certified reference materials in Appendix C CIPM MRA	
<i>Endorsed at the 11th meeting of COOMET Technical Committee 1.12 “Certified Reference Materials (Yekaterinburg, Russia, 17 May, 2006) Approved at the 17th COOMET Committee Meeting (Minsk, Belarus, April 24 – 25, 2007)</i>		

INTRODUCTION

At the modern stage of international cooperation and interaction of metrological services of different countries special importance and urgency is attached to the problems of confidence in the results of various metrological activities, ranging from the agreement of the sizes of units reproduced by national measurement standards, to the results of calibration and verification of measuring instruments.

In this connection, International Bureau of Weights and Measures (BIPM) developed Mutual Recognition Arrangement (MRA) for the mutual recognition of national measurement standards and of calibration and measurement certificates issued by national metrology institutes.

At the present time international organizations (OIML, ISO, organizations of Metric Convention (CIPM, BIPM)) single out certified reference materials (CRMs) of substances and materials as independent “measurement standards”(see, e.g., OIML D1 “Elements of Law on metrology”, International vocabulary of basic and general terms in metrology, final 2004 version). That is why inclusion of CRM metrological characteristics in Appendix C of the MRA is considered by the international measurement community as the demonstration of calibration and measurement capabilities (CMC) (see, e.g., CIPM 2005-08), as evidenced by numerous tables (forms), placed at the BIPM site.

But, due to their specific character, CRMs have a number of distinctive properties, as compared with measurement standards.

Thus, the 22nd General Conference of Weights and Measures in its resolution concerning the activity of Consultative Committee for the Amount of Substance (CCQM) pointed out, that CMC template for CRMs (relating, primarily, to the field of chemistry) differs from CMC template in physical and technical fields and needs to be further discussed. As a whole, the Conference appreciated the CCQM activities in this direction and in Resolution 1 mentioned, that CRMs are also needed for comparison of national standards.

The document CIPM 2005-08 “Guidelines for the Acceptance of Certified Reference Materials in Appendix C of the CIPM Mutual Recognition Arrangement” envisages the listing of CRMs in Appendix C of the MRA, including the listing without carrying out Key Comparison or Pilot Study. But in the latter case the authors are strongly recommended to have additional information available justifying the claimed CMC by publications in international journals or by peer review.

At that it is pointed out, that the activities on CRM development and use should strictly meet the requirements set out in ISO Guides 30, 31, 34, 35.

Due to the great variety of possible comparisons of CRMs of different level, it seems to be possible to carry out works on comparisons within COOMET or other international organizations without registration, in certain cases, in Appendix B of the MRA. Nevertheless, if it is considered expedient, (e.g., when CRMs are used in comparisons of national standards), certain CRM types, listed in Appendix C, may be subject to international comparisons by NMIs or designated institutes of other countries.

Taking into consideration the above said, this document specifies certain guidelines for the acceptance of certified reference materials in Appendix C of the MRA within COOMET, with due account of their specific character, and establishes procedural and methodical principles for carrying out the relevant works using CRMs.

1. Scope

This recommendation defines the guidelines for the acceptance of metrological characteristics of certified reference materials of substances and materials in Appendix C of the Mutual Recognition Arrangement for the mutual recognition of national measurement standards and of calibration and measurement certificates issued by national metrology institutes and methodical and procedural principles for carrying out the relevant works on the review of CMC, based on CRM use, within COOMET.

The recommendation is drawn up on the basis of the following documents:

COOMET D3/1998 Memorandum of understanding on the development and use of certified reference materials of composition and properties of substances and materials within COOMET

COOMET D4/2003 COOMET publications. Classification, procedure of development, approval and registration. Basic principles

OIML D 1 Elements of law on metrology

ISO Guide 30:1992 Terms and definitions used in connection with reference materials

ISO Guide 35: 2005 Certification of reference materials - General and statistical principles.

2. References

In this recommendation references are made to the following normative documents:

Mutual Recognition Arrangement for the mutual recognition of national measurement standards and of calibration and measurement certificates issued by national metrology institutes

COOMET R/GM/7:2004 Procedure of conducting inner expertise of measurement and calibration capabilities of COOMET national metrological institutes and interregional expertise of the institutes of other regional metrological organizations

COOMET R/GM11:2006 Regulations for comparison of measurement standards from the national metrological institutes of COOMET

Document CIPM 2005-08 Guidelines for the acceptance of certified reference materials in Appendix C of the CIPM Mutual Recognition Arrangement

ISO Guide 31:2000 Reference materials – contents of certificates and labels

ISO Guide 34:2000 General requirements for the competence of reference material producers.

3. General concepts

3.1 To implement the MRA for the mutual recognition of national measurement standards and of calibration and measurement certificates issued by national metrology institutes CRMs may be used with a view:

- to demonstrate NMIs' CMC on the basis of CRM metrological characteristics;
- to facilitate practical works on comparisons of measurement standards from COOMET member-countries as portable (transportable) transfer standards.

Note. The use of CRMs for comparisons of measurement standards is beyond the subject-matter of this recommendation.

3.2 The activities on presenting and assessment of NMIs' CMC on the basis of CRM metrological characteristics are organized within COOMET TCs for the fields of measurements (subject committees). Cooperation is effected within the projects included in COOMET Working Programme.

4. Organization and procedure of works on the declaration of NMIs' calibration and measurement capabilities on the basis of CRM metrological characteristics.

4.1 NMIs submit the information on CMC based on CRM metrological characteristics through TC member from their country to the Chairman of the relevant TC with the copy being sent to the Chairman of COOMET JCSM.

4.2 The information on CMC using CRM metrological characteristics is submitted by NMIs in the format of Appendix A.

The values of CRM certified characteristics should be traceable to measurement standards or, if this is impossible, to other internationally agreed references.

Note. The guidelines for completing the requisite elements of Appendix A and the list of amounts of substance categories are given in reference Appendices C and D.

4.3 The supplementary information for the recognition of the data submitted by NMIs is as follows:

- availability of results of CRM comparisons carried out within COOMET, other international organizations and bilaterally; when the claimed CMC are not underpinned by any comparisons, the authors of the proposals are recommended to submit additional information justifying the CMC by publications in international journals or by peer review;

- NMIs' activities;

- operation of the quality system in NMIs in accordance with the requirements of ISO Guide 34 or equivalent;

- participation of NMIs in cooperation on CRMs with other international organizations (research works in concert with the institutes of the foreign countries).

This information is submitted in the format of Questionnaire (appendix B) and may be supplemented at the discretion of NMIs.

4.4 The Chairmen of TCs carrying out the works on the assessment of NMIs' CMC, based on CRM metrological characteristics, organize these works according to the procedure set out in COOMET document R/GM/7:2004.

5. Principles for the assessment of NMIs' measurement capabilities based on CRM metrological characteristics.

5.1 The assessment of NMIs' CMC based on CRM metrological characteristics is performed by carrying out an examination of submitted data.

5.2 Metrological examination should, in the first place, establish, if CRM metrological characteristics fall in line with the capabilities of methods and means applied during their certification. The assessment is carried out based on international and national (national documents of the country represented by an expert) normative documents.

The information of NMIs, given in the Questionnaire (see clause 4.3) provides the experts with an extra opportunity to assess the degree of NMIs' competence.

5.3 The examination is carried out within COOMET TCs in specific field of measurement under the supervision of TC Chairman with participation of official experts, representing COOMET member-countries and having highest competence in methodology of CRM development and use in this field of measurement (i.e., this activity should be specified in the relevant document, for example, in Regulations on TCs). The list of experts is agreed upon at the meeting of the corresponding TC.

5.4 On the basis of the examination results an expert prepares evaluation report the in compliance with the requirements of COOMET document R/GM/7:2004, either adding the column "The expert's comments" to the table of Appendix A or following the form of the table of Appendix 2 of COOMET document R/GM/7:2004.

The evaluation report (if necessary) may include the proposals on CRM comparison, including similar CRM types.

5.5 For special reasons during the discussion of the examination results (e.g., if the CRMs are used in the comparison of national standards) it may be considered reasonable to subject CRMs, listed in Appendix C, to international comparisons by NMIs of other countries.

6. Confirmation of NMIs' calibration and measurement capabilities based on CRM metrological characteristics.

6.1 Confirmation of NMIs' CMC may be conducted based on CRMs comparisons or on the basis of additional information to justify CMC, submitted by the author by publications in an international journal or by peer review.

6.2 In case that the calibration and measurement capabilities based on comparisons of CRM, offered by the experts during the examination of submitted data, are confirmed, NMI, the author of the proposals organizes CRM comparisons following the procedure, set out in the document R/GM/11/2006. CRM comparisons in the framework of COOMET may be carried out without registration in Appendix C of the Agreement.

6.3 In the case that NMI's calibration and measurement capabilities are confirmed based on additional information, justifying CMC, submitted by the author, in the form of information on publications in international journals, the expert considers the publications concerned with due account of the provisions of clause 5 of this recommendations.

6.4 In the case that NMI's calibration and measurement capabilities are confirmed based on the peer review, the expert:

- either recognizes the results of certification carried out in the country during the recognition of the developed CRM type (which is the case in the countries such, as Russia, Germany, CIS countries);
- or requests documentation on CRM in the amount as recommended by ISO Guide 31:2000 "Reference materials – contents of certificates and labels"

INFORMATIVE DATA

COOMET RECOMMENDATION

1. Organization-coordinator: *The Urals Research Institute for Metrology (UNIIM)*
2. COOMET Project: *290/RU/2003*
3. The Recommendation is approved at 17 COOMET Committee meeting
4. Information on the use of the document by COOMET member-organizations.

Taking into consideration that this COOMET recommendation is of organizational and methodical nature and describes the procedure to follow by all COOMET structural bodies in carrying out works on the use of CRMs, it is applied by all COOMET member-organizations.