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**General requirements for the program of reference material certification**

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International Organization

of Legal Metrology

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**General requirements for the programme of reference material**

**certification**

**0 Scope**

This International Document sets out the requirements for the programme of reference material (RM) certification, covering the description of specific procedures for the determination of metrological characteristics of reference materials of the same type, released in series by the producer of certified reference materials (CRMs), used in metrological activities, covered, in conformity with national laws, by state metrological control and supervision (SMCS), exercised by national services of legal metrology.

It is recommended, that the principles, set out in this International Document be implemented by (C)RM producers in the development and release of RMs and CRMs, used for the purposes of legal metrology, in the activities of national services of legal metrology and accreditation bodies, in the development of OIML publications.

This International Document has been developed taking into consideration the general concepts, expressed in ISO/REMCO and OIML international publications concerning the development, release and use of RMs and CRMs. Account has also been taken of the concepts of OIML publications, establishing the use of reference materials in fields, covered by metrological control, exercised by national services of legal metrology [А.1].

This International Document is also based on ISO/REMCO Guides 30-35 (see Annex A) and supplements these Guides as concerns the requirements for (С)RM producers’ documentation on RM certification, to be taken into consideration in the determination of metrological characteristics and the certification of released lots of (С)RMs of the same type are carried out.

**1 General concepts**

CRMs are widely used as measurement standards of units for the calibration of measurement instruments, validation and control of measurement procedures, etc. Uninterrupted release of interchangeable (С)RMs of the given type from batch to batch of proper quality can be ensured by the producer of (С)RMs, provided, that he has documented procedures (technological documentation, as described in

subclause 4.4 [A.1]), clearly and in detail describing the range, sequence and specific work on the production of (С)RM and RM certification.

*Note:*

(С)RMs, produced in compliance with the same technical documentation, from the same or similar in composition material, having the same metrological characteristics, intended use, established metrological traceability are referred to as (С)RMs of one and the same type.

The important step in (С)RM release is the determination of their metrological characteristics (determination of (С)RM homogeneity and stability, (C)RM characterization, based on the research of candidate (C)RM material (hereinafter referred to as (C)RM material), calculation of RM certified value and uncertainty) and RM certification.

Technological documentation, describing the range, sequence of works on the determination of metrological characteristics of RMs of the same type is the programme of RM certification, which includes specific operations and procedures and relates to the documentation of (С)RM producer’s quality management systems, [А.6].

*Note:*

The definition of the term “certification of RM” is given in subclause 4.1 [A.2], procedure for RM certification is described in clause 11 [A.7].

This International Document specifies the minimum requirements for the programme of certification of RMs released in series. The concepts of this International Document may be extended in national regulatory documents taking into account specific features and practical work experience in various countries.

ISO/REMCO Guides 34-35 may serve as a useful guidance in resolving this question (see Annex A).

**2 Terminology**

The terminology used in this Document is in line with:

* The *International vocabulary of metrology – Basic and general concepts and associated terms* (VIM) [А.8];
* The *International vocabulary of terms in legal metrology* (VIML) [А.9];
* ISO Guides 34-35 (subclauses A.2 –A.7 of Annex A).

**3 General requirements for the programme of reference material certification**

**3.1** The (С)RM producer develops the programme of RM certification to establish the amount, sequence of works, description of specific procedures, carried out when determining metrological characteristics of released (С)RMs of the given type with specified intended use and accuracy.

*Notes:*

1 The programme of RM certification is an integral part of (С)RM technological documentation for RM release.

2 The programme of RM certification may be issued as a separate document or as a section of RM technical assignment, section or part of the document (specifications), which establishes the order of RM serial production.

**3.2** The programme of RM certification is intended for use by the personnel of (С)RM producer, periodically performing specific work on the determination of RM metrological characteristics in the release of new (С)RM batches or specimens with specified intended use.

*Note:*

The personnel of (С)RM producer, conducting the work on the determination of metrological characteristics of RM of the given type should be made aware of the certification programme.

**3.3** The programme of RM certification is developed prior to the work on the determination of RM metrological characteristics based on initial data (e.g., the intended use of the future (С)RM, planned limits of the values of its metrological characteristics, planned conditions of transportation, storing and safety of the (С)RM, etc.) and contained in (С)RM technical assignment (project).

**3.4** In the developmentof RM certification programme, the requirements are established to the selected procedure of:

- the preparation of the RM material prior to the determination of RM metrological characteristics:

- conducting preliminary research of the possibility to determine RM metrological characteristics (as appropriate).

In the programme of RM certification specific requirements are established for:

- the number and the quantity of laboratories, which will make measurements in the framework of the determination of RM metrological characteristics;

- the procedure for the determination of RM metrological characteristics;

- the method (-s) of the establishment and demonstration of metrological traceability of RM property values;

- the time schedule for carrying out the work on the determination of RM metrological characteristics.

**3.5** Thesection“The procedure for the determination of RM metrological characteristics” describes:

- the procedure for the determination of RM material homogeneity;

- the procedure for the determination of RM material stability;

- the procedure for the characterization of RM material;

and establishes the requirements for:

- the applied measurement procedures, measurement instruments, (С)RMs, other equipment, used in the determination of RM metrological characteristics;

- the measurement standards of units, ensuring the establishment of metrological traceability or (in their absence) to the accepted references;

- the number of samples, the number of measurement results, needed for the determination of RM homogeneity and stability, RM characterization, frequency of measurements;

- the conditions of carrying out experimental work;

- the algorithms of processing measurement results, obtained within the works on the determination of RM metrological characteristics;

- the algorithms for the calculation of RM certified value, uncertainty of the certified value and its components;

- the form of reporting the obtained results.

*Notes:*

1. The programme of RM certification may include the requirements for measurement conditions, the qualification of operators, in case there are special requirements, not specified in the applied procedures.

2. If necessary, the procedure for the determination of RM metrological characteristics may include the procedure for the research of RM commutability.

3. When describing specific requirements (subclauses 3.3, 3.4) it is recommended to follow provisions set forth in [А.6, А.7].

**3.6** Recommendations on the structure and presentation of RM certification programme are given in Annex B.

**3.7** The title page of RM certification programme shall contain the date of its approval. The pages of the document shall be enumerated.

**3.8** The programme of RM certification shall include the sheet of changes, which, if required, may be subject to changes and additions over time.

**3.9** The programme of certification of RMs, intended for the use in the field of SMCS[А.1], is subject to metrological examination, which evaluates:

- the correct use of metrological terms and concepts, designations and symbols of the SI units;

- the completeness of presentation of the procedure for the determination of RM material homogeneity, the procedure for RM material characterization, the procedure for the determination (monitoring) of RM material stability, sufficient to carry out the relevant work by the personnel of (С)RM producer.

-the conformity of selected measurement procedures, measurement instruments, measurement standards of units with the criteria, specified in [А.6, А.7];

- the conformity of requirements for the sub-contractors, carrying out the work on the determination of the RM metrological characteristics, the requirements for laboratories, carrying out measurements, with the criteria, specified in [А.6, А.7];

- the validity of choice of the method of establishing (С)RM metrological traceability, including the account of provisions, set out in [А.6, A.7 A.10];

- the conformity of the algorithms of the calculation of RM certified value, the uncertainty of the certified value and its components with the provisions, set out in [А.7] and in national regulatory documents.

*Note:*

Metrological examination of documentation is carried out in conformity with provisions, adopted in the countries.

Positive results of metrological examination are the basis for the decision, taken by RM producer to approve RM certification programme.

**3.10** (С)RM producer may introduce amendments in the RM certification programme over time with due account of provisions [А.6].

*Note:*

When the amendments, introduced in the programme of RM certification are related to the amendment in the method of the determination of RM certified value, measurement procedures, used in the determination of RM metrological characteristics, the certification programme is subject to repeated metrological examination to verify the possibility of the release of (С)RM of the given type with specified intended use and accuracy.

**Annex А:**

**Bibliography**

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| А.1 | OIML International Document D 18, *The use of certified reference materials, in fields, covered by metrological control, covered by national cervices of legal metrology. Basic principles,* 2008 |
| А.2 | ISO Guide 30:1992, *Terms and definitions, used in connection with reference materials*  ISO Guide 30:1992 Amd. 1:2008, *Revision of definitions for reference material and certified reference material* |
| А.3 | ISO Guide 31:2000, *Reference materials – content of certificates and labels* |
| А.4 | ISO Guide 32:1997, *Calibration in analytical chemistry and use of certified reference materials* |
| А.5 | ISO Guide 33:2000, *Uses of certified reference materials* |
| А.6 | ISO Guide 34:2009, *General requirements for the competence of reference material producers* |
| А.7 | ISO Guide 35:2006, *Reference materials – general and statistical principles for certification* |
| А.8 | OIML V 2-200, *International Vocabulary of Metrology — Basic and General*  *Concepts and Associated terms* (VIM), 3rd Edition. (Edition 2010 with minor  Corrections), 2012 |
| А.9 | OIML V 1*, International vocabulary of terms in legal metrology*  (VIML), 2013 |
| А.10 | *Joint BIPM, OIML, ILAC and ISO Declaration on Metrological Traceability*.  OIML Bulletin, Volume LIII, Number 1, January 2012. |

**Annex В**

**(recommended)**

**В.1 Structure and content of reference material certification programme**

В.1.1 The name of the document, establishing RM certification programme, is based on the area of its application.

*Example:*

“The programme of certification of a reference material for composition of diesel fuel of serial production”

В.1.2 RM certification programme includes the introductory part and the following sections:

- general concepts;

- preparation of RM material for the work on the determination of RM metrological characteristics;

- subcontractors, participating in the work on the determination of RM metrological characteristics (as appropriate);

- procedure for the determination of RM metrological characteristics;

- method of the establishment and demonstration of metrological traceability of RM property values;

- the form of reporting the results of the determination of RM metrological characteristics;

- the time schedule for carrying out the work on the determination of RM metrological characteristics;

- RM certification.

*Note:*

It is allowed to delete or supplement these sections taking into consideration RM specific features and the data, established in the determination of metrological characteristics of the first (С)RM batch or specimen.

В.1.3 Introductory part establishes the intended use and scope of RM certification programme.

Introductory part is set out as follows: “This document establishes RM certification programme (the name of RM is indicated), to be used in (С)RM serial issue”.

В.1.4 Section “General concepts” of the programme includes subsections, specified under subclauses В.1.4.1-.В.1.4.2.

В.1.4.1 Subsection “Information on RM producer”

This subsection includes the name and the address of RM producer.

В.1.4.2 Subsection “The names of RM metrological characteristics to be determined”

This subsection lists the names of metrological characteristics to be determined and specifies the interval of permissible values of RM characteristics to be certified, namely:

- the name of characteristic (-s) to be certified,

- the range of permissible certified values and uncertainties of certified value (-s),

- other information (as appropriate).

Note:

This subsection may provide a reference to other documents of (С)RM producer, in which this information is given.

В.1.5 Section “Preparation of RM material for the work on the determination of RM metrological characteristics”

This subsection includes the requirements for:

- the procedure for sampling RM material to carry out the work on the determination of RM metrological characteristics (as appropriate);

- the procedure for conducting preliminary research of the possibility to determine RM metrological characteristics (as appropriate);

- the procedure for RM material preparation.

В.1.5.1 Subsection “The requirements for sampling RM material”, prepared as appropriate, includes the requirements for:

- qualification of the operator, conducting the sampling (e.g. the information on qualification of the operator, his education, the information of his skill upgrading and safety training, etc.);

- the period of time within which the sampling of RM material should be completed;

- the equipment, measurement instruments, used for RM material sampling (the name of equipment, measurement instruments, identification of documents, according to which they are issued, requirements for calibration of measurement instruments (if required));

- the amount of material, sufficient for all kinds of measurements (e.g. mass and/or volume of 5material, etc.);

-the procedure of material sampling (description of sampling procedure is provided);

- container, into which the borrowed samples of RM material are placed (the name of container, material, the container is made of, capacity of the container (volume and/or mass);

- the marking RM material sample (the type of marking, the form of marking), storage and transportation conditions (if required) of borrowed samples of RM material

В.1.5.2 Subsection “Requirements for the procedure for conducting preliminary research of the possibility to determine RM metrological characteristics” is included in RM certification programme in cases where doubts arise in obtaining sufficiently homogeneous and stable RM and/or in the capability of selected laboratory (-s) to make measurements.

The subsection describes the concrete procedures, ensuring the work on defining the feasibility of experiments and the capability of laboratory (-s), involved in the experiment to make measurements.

В.1.5.3 The subsection “Requirements for RM material preparation procedure” is included in the programme of RM certification when the certified value of RM is determined by preparation procedure.

Subsection “Requirements for RM material preparation procedure” includes the information on RM material preparation procedure, providing the requirements for:

- the initial materials (substances), used for the preparation of RM material;

- the measurement instruments, used for the preparation of RM material;

- the qualification of personnel, engaged in the preparation of RM material;

- the environmental conditions, under which RM material is prepared;

- the RM material preparation procedure;

- the identification and labelling of RM material;

- the containers into which the prepared RM material is placed;

- the storage conditions for the prepared RM material.

В.1.6 Section “Subcontractors, participating in the work on the determination of RM metrological characteristic”

This section is included when subcontractors are involved in the work on the determination of RM metrological characteristics. It includes:

- the requirements for the competence of subcontractors and testing laboratories, involved in measurements and determination of RM metrological characteristics taking into consideration recommendations [A.6, A.7];

- the specific kind of work, performed by subcontractor, the terms of interaction.

*Note*

It is possible to include other required information on legal entities, involved in the work, on laboratory accreditation.

В.1.7 Section “The procedure for the determination of metrological characteristics of reference material”

This section includes the requirements for the procedure for the determination of RM metrological characteristics, including the procedure for the determination RM homogeneity, RM characterization, the determination of RM stability. Recommended contents of the procedure for the determination of RM metrological characteristics are described in subclause B.2.

В.1.8 Section “Method of the establishment and demonstration of metrological traceability of RM property values”

This section includes the information (e.g. the number, name, etc.) on national or international measurement standards of units or other accepted references, which ensure the obtaining measurement results with established metrological traceability of property values.

*Note:*

It is recommended to provide in this section the unit (-s), to which metrological traceability of property values is ensured and the scheme of the unit transfer in the determination of RM certified value.

In case, when it is difficult to establish metrological traceability of property values, the information on the proposed procedure (-s), specified under [subclauses 5.12 А.6] is provided.

В.1.9 Section “The form of reporting the results of the determination of RM metrological characteristics”

This section provides the form for reporting the established metrological characteristics, and also the requirements for presentation of documents on the results of RM certification taking into consideration the provisions, set out in [А.3, А.6, А.7].

В.1.10 Section “Time schedule for carrying out the work on the determination of RM metrological characteristics” is reported as appropriate.

This section indicates the time schedule for carrying out the work on the determination of RM metrological characteristics

В.1.11 Section “RM certification”

This section describes the work on RM certification in conformity with clause 11 [А.7].

**В.2 The content of the section “Procedure for the determination of metrological characteristics of reference material”**

В.2.1 The section “Procedure for the determination of metrological characteristics of reference material” includes the following sections:

- procedure for the determination of RM material homogeneity;

- procedure for the determination of RM material stability;

- procedure for the characterization of RM material;

*Notes:*

1 It is allowed to delete or merge these sections or include additional sections taking into consideration C(RM) specific features.

2 It is allowed to issue the procedure for the determination of RM material homogeneity and the procedure for the determination of RM stability as separate documents.

В.2.2 The section “Procedure for the determination of RM material homogeneity” includes subsections, described under subclauses В.2.2.1- В.2.2.8.

В.2.2.1 Subsection “Characteristics to be certified, according to which the determination of homogeneity is carried out”

This subsection includes:

- the names of characteristics to be certified, according to which the determination of homogeneity is carried out;

- the type of inhomogeneity (between-bottle, within-bottle ), to be studied.

В.2.2.2 Subsection “Measurement instruments, reference materials, chemical reagents, testing equipment, etc., used for carrying out work on the determination of homogeneity” is prepared in the absence of appropriate information in documented measurement procedures, used in the determination of RM metrological characteristics.

This subsection provides the list of measurement instruments, (C)RMs, support devices, materials, chemical reagents, used in measurements.

В.2.2.3 Subsection “Measurement conditions”

Subsection “Measurement conditions” establishes the requirements for the environment, accommodation and other factors, affecting measurements, RM material or provides reference to the measurement procedure (-s) in use.

В.2.2.4 Subsection “Preparation of RM material for measurements”

This subsection provides (as appropriate) the description of preparatory work, related to RM material preparation for measurements, carried out prior to measurements, namely:

- the information on the amount of borrowed samples of RM material for measurements, on the mass of samples;

- the information on the methods of preparation of RM surface for measurements (for solid materials);

- the information on the material package, in which RM material is stored during the determination of RM homogeneity;

- other information.

В.2.2.5 Subsection “Measurement procedure (-s), used in the determination of RM material homogeneity”

This subsection describes the measurement procedure (-s), used in the determination of RM homogeneity or provides reference to the appropriate documented measurement procedure (-s).

В.2.2.6 Subsection “Carrying out work”

This subsection describes the procedure of work in the determination of RM homogeneity:

- the list and sequence of operations, performed in the determination of RM homogeneity;

- the details of the part of RM, within-bottle homogeneity of which is studied (e.g. disc diameter, cylinder height, etc., for solid material; the mass of the sample to be tested, the mass of the minimum representative sample for disperse material, etc.

- the number of measurements, the frequency of measurements for the determination of within-bottle inhomogeneity;

- the number of measurements, the frequency of measurements for the determination of between-bottle inhomogeneity;

- the requirements for reporting intermediate and final measurement results

(the number of significant figures, etc.).

В.2.2.7 Subsection “Algorithm of the calculation of standard uncertainty due to reference material inhomogeneity”

This subsection contains the algorithm of measurement results processing to calculate the value of the standard uncertainty due to RM inhomogeneity or the reference to the appropriate document, in which the algorithm is described.

В.2.2.7 Subsection “Additional information”

This subsection contains the requirements for the necessity of recording additional information, obtained from the results of the determination of RM homogeneity, namely:

- minimum representative sample (for dispersed materials),

- details of the part of solid RM material, in which the homogeneity study is carried out (for solid materials),

- other information

for providing the relevant information in the report of RM certification and in CRM certificate.

В.2.2.8 It is recommended to include in the procedure for the determination of RM homogeneity the following subsections:

- “Requirements for qualification of operators” containing the information about the level of skills (e.g. profession, education, experience, etc.) of the personnel, permitted to carry out the work;

- “Requirements for safety of work”, establishing the requirements, that will ensure safety at work, compliance with the norms of workplace sanitation and environmental protection.

*Note:*

If the normative documents, regulating the requirements for safety, workplace sanitation and environmental protection are available, a reference to these documents is provided in this subsection.

В.2.3 Section “Procedure for the determination of RM stability”

Section “Procedure for the determination of RM stability” includes subsections, specified under subclauses В.2.3.1 - В.2.3.12.

В.2.3.1 Subsection “The list of factors, affecting RM stability”

This subsection provides the list of factors, affecting RM stability (e.g. temperature, humidity, light, etc.) affecting RM stability.

В.2.3.2 Subsection “Method of reference material stability study”

This subsection provides the information on the method, used to study RM short-term and long-term stability in conformity with [А.7]:

- isochronous method (method of accelerated ageing),

- method of natural ageing.

В.2.3.3 Subsection “Storage conditions of reference material and frequency of measurements in the determination of reference material stability”

Subsection includes:

- RM storage conditions

* environmental conditions (temperature, humidity, light, etc.), under which RM is stored,
* material of container, in which RM is stored during RM stability study;

- the frequency of measuring the value of RM characteristic to be certified in the determination of RM stability using the chosen method of stability study.

When selecting parameters it is recommended to follow the provisions set out in [А.7].

В.2.3.4 Subsection “Measurement instruments, reference materials, chemical reagents, testing equipment, etc., used for carrying out work on the determination of stability” is prepared in the absence of appropriate information in documented measurement procedures, used in the determination of RM metrological characteristics.

This subsection provides the requirements, specified under subclause В.2.2.2.

В.2.3.5 Subsection “Measurement procedure (-s), used in the determination of reference material stability”

This subsection describes the measurement procedure (-s), used in the determination of RM stability or provides reference to the appropriate documented measurement procedure (-s).

В.2.3.6 Subsection “Preparation of RM material for measurements”

This subsection provides the description of preparatory work, related to RM material preparation for measurements, carried out prior to measurements.

В.2.3.7 Subsection “Execution of works”

This subsection describes the procedure of works in:

- defining RM storage conditions,

- defining RM transportation conditions,

- selecting of RM package material,

namely:

- the list and sequence of operations;

- the number of measurements, the frequency of measurements;

- the requirements for reporting intermediate and final measurement results

(the number of significant figures, etc.).

- others.

*Notes:*

This information shall be provided for each experiment in the determination of

- short-term stability,

- long-term stability (when C(RM) transportation is planned).;

- RM material stability after opening the package of RM (when RM storage and use is allowed after opening the package).

В.2.3.8 Subsection “The form of reporting measurement results, obtained in the determination of reference material stability”

This subsection provides the form of reporting measurement results, obtained in the determination of RM stability

В.2.3.9 Subsection “Algorithm of the calculation of standard uncertainty due to instability of reference material” This subsection provides the algorithm of the calculation of:

- standard uncertainty, characterizing RM short-term and long-term instability;

- RM life time

or the reference to the appropriate document, in which the algorithm of calculation is set out.

В.2.3.10 Subsection “The form of reporting the results of the determination of reference materials stability”

This subsection provides:

- the form of reporting standard uncertainty due to short-term and long-term stability, life time of RM after its production;

- the information on how to achieve the integrity of reference material and immutability of its metrological characteristics:

* - RM storage conditions;
* - RM transportation conditions;
* - RM package (including package material ), RM shipping container, ensuring RM stability under storage and transportation conditions during the validity of (C)RM certificate and RM transportation;
* - possible restriction of RM life time after opening the package , RM storage conditions after opening the package.

В.2.3.11 Subsection “Monitoring of RM stability”

This subsection provides the information on the procedure of monitoring RM stability in conformity with provisions, set out in clause 8 [А.7].

В.2.3.12 It is recommended to include in the procedure subsections “Requirements for qualification of operators” and “Requirements for safety of work”, specified under subclause В.2.2.8.

В.2.4 Section “Procedure for reference material characterization” is prepared taking into consideration the recommendations, set out under subclauses В.2.4.1 – В.2.4.9.

В.2.4.1 Subsection “Method of reference material characterization”

This subsection provides the method of reference material characterization in conformity with [А.7].

*Note:*

The content of the procedure of the determination of RM certified value depends on the method of RM characterization.

В.2.4.2 Subsection “Information on measurement standards of units, measurement instruments, reference materials, chemical reagents, testing equipment, etc., used in reference material characterization” is prepared in the absence of appropriate information in documented measurement procedures, used in RM characterization.

This subsection provides the information on measurement standards of units, measurement instruments, (C)RMs, testing equipment, establishes the requirements for their metrological characteristics, calibration, certification.

В.2.4.3 Subsection “Measurement procedure (-s), used in the determination of the certified value of reference material”

This subsection describes the procedure (-s), used in the determination of RM characteristic to be certified or provides reference to the document (-s) in which it (they) is (are) established. This subsection provides the information on the units, to which the metrological traceability of measurement results is ensured in the realization of measurement procedure.

В.2.4.4 When RM certified value is determined using measurement standard of unit, section “Procedure for the determination of RM certified value” shall additionally include:

- the information on the measurement standard of unit;

- the information on measurement conditions;

- the information on the number of test results to be obtained when measurements are made using measurement standards;

- the form of reporting measurement results;

- the algorithm of the calculation of RM certified value and standard uncertainty due to RM characterization, taking into account the provisions, set out in [А.7].

В.2.4.5 When the value of RM characteristic to be certified is determined from the results of interlaboratory experiment, section “Procedure for the determination of RM certified value” shall additionally include subsection, specified under

subclause В.2.4.5.1.

*Note:*

In case of reference material characterization based on the results of interlaboratory experiment subsections, specified under subclauses В.2.4.2 – В.2.4.4 are included in section “Procedure for the determination of RM certified value” as appropriate.

В.2.4.5.1Subsection “Information on the programme of interlaboratory experiment”

*Note:*

It is recommended to prepare the programme of interlaboratory experiment as a separate document.

The programme of interlaboratory experiment shall include:

- the information on RM material (RM material, the name of characteristics to be certified, minimum representative sample, methods of sample storage, safety measures when working with samples, etc.) submitted to laboratories;

- the recommended measurement procedures (methods) to measure the values of RM characteristics to be certified (as appropriate);

- the time schedule for carrying out work, including the time for sample distribution and obtaining the protocols of measurement results;

- the requirements for the number of measurement results, obtained in laboratories;

-the requirements RM sampling procedure, performed in laboratories (as appropriate);

- the requirements for measurement conditions to be provided by laboratories when carrying out experimental work;

- the requirements for metrological traceability of measurement results, obtained in each laboratory;

- the form of reporting the values of RM certified characteristics by laboratories.

- other requirements, specified in [А.7] (as appropriate).

В.2.4.7 Subsection “Processing of measurement results”

This subsection provides the information on the algorithms of calculation of RM certified value, standard uncertainty due to RM characterization taking into account the provisions, set out in [А.7].

В.2.4.8 Section “Algorithm of the calculation of the expanded uncertainty of RM certified value”

This section provides the algorithm of the calculation of the expanded uncertainty of RM certified value, including the uncertainty due to inhomogeneity, instability and due to RM characterization taking into account the provisions of [А.7].

В.2.4.9 It is recommended to include in the procedure the subsection “Requirements for qualification of operators”, “Requirements for safety of work”, specified under subclause В.2.2.8.