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Reference materials — Selected terms and definitions

Matériaux de référence — Termes et définitions choisis

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is the ISO Committee on Reference Materials (REMCO), which is concerned with guidelines for the preparation, certification and use of reference materials (RMs) and certified reference materials (CRMs). The first edition of this Guide (1981) was the outcome of collaboration between REMCO and the organizations EEC, IAEA, OIML, IUPAC, IFCC and WHO, and was produced largely by Dr D. A. Lowe of WHO and Prof. Dr R. Neider of BAM. The revision leading to the second edition was undertaken because it had become apparent that some confusion existed as to what types of measurement standards or etalons should legitimately be included within the definition of an RM. Moreover, the recognition that CRMs are measurement standards made it desirable to examine the vocabulary of standards in metrology, as detailed in the International vocabulary of basic and general terms in metrology (VIM), currently published as ISO/IEC Guide 99:2007 and as JCGM 200:2012, with particular reference to CRMs.

This third edition of ISO Guide 30 cancels and replaces ISO Guide 30:1992. It was revised principally for introducing new definitions for RMs and CRMs as well as to update other terms and definitions. The definitions for RM and CRM were developed by REMCO to incorporate the concepts of both quantitative and qualitative analysis. There exist different definitions for these terms in other sources, notably ISO/IEC Guide 99:2007 and JCGM 200:2008. It remains as a future goal to harmonize these definitions in subsequent editions of these terminology guides. The terms included in this version are limited to those required to support the principles and concepts set forth in other REMCO Guides. Existing definitions in referenced publications are used wherever possible. In other cases, some definitions are specifically tailored to enhance the understanding of RMs and their uses.

Where definitions from other references are used, the source is given. References to similar terms defined in other sources are indicated in a note after the prompt "See also".

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Introduction

Reference materials (RMs) and certified reference materials (CRMs) (defined in 2.1 and 2.2) are widely used for the calibration of measuring apparatus, for the evaluation of measurement procedures and for the internal or external quality control of measurements and laboratories. They may enable the expression of functional properties, for instance in certain cases relevant for biology or material sciences, in arbitrary units. RMs and CRMs play an increasingly important role in national and international standardizing activities and in the accreditation of laboratories.

This document is intended to serve as a guide to terms and definitions used in connection with the production and use of RMs as described in the respective ISO guides. It should prove useful in helping to ensure a greater degree of uniformity in the terminology used by different organizations concerned with the production and use of RMs throughout the world.

In some cases, admitted alternate terms are listed below the bold typeface defined term.

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Reference materials — Selected terms and definitions

1 Scope

This Guide recommends terms and definitions that should be used in connection with reference materials, with a particular emphasis on terms that are used in reference material product information sheets, certificates and corresponding certification reports.

2 Terms and definitions

2.1 Terms related to materials

2.1.1
reference material
RM
material, sufficiently homogeneous and stable with respect to one or more specified properties, which has been established to be fit for its intended use in a measurement process

Note 1 to entry: RM is a generic term.

Note 2 to entry: Properties can be quantitative or qualitative, e.g. identity of substances or species.

Note 3 to entry: Uses may include the calibration of a measurement system, assessment of a measurement procedure, assigning values to other materials, and quality control.

Note 4 to entry: ISO/IEC Guide 99:2007[1] has an analogous definition (5.13), but restricts the term "measurement" to apply to quantitative values. However, Note 3 of ISO/IEC Guide 99:2007, 5.13 (VIM), specifically includes qualitative properties, called "nominal properties".

2.1.2
certified reference material
CRM
reference material (RM) characterized by a metrologically valid procedure for one or more specified properties, accompanied by an RM certificate that provides the value of the specified property, its associated uncertainty, and a statement of metrological traceability

Note 1 to entry: The concept of value includes a nominal property or a qualitative attribute such as identity or sequence. Uncertainties for such attributes may be expressed as probabilities or levels of confidence

Note 2 to entry: Metrologically valid procedures for the production and certification of RMs are given in, among others, ISO Guides 34[2] and 35[3].

Note 3 to entry: ISO Guide 31[4] gives guidance on the contents of RM certificates.

Note 4 to entry: ISO/IEC Guide 99:2007[1] has an analogous definition (5.14).

2.1.3
candidate reference material
material, intended to be produced as a reference material (RM)

Note 1 to entry: A candidate material has yet to be characterized and tested to ensure that it is fit for use in a measurement process. To become an RM, a candidate material needs to be investigated to determine if it is sufficiently homogeneous and stable with respect to one or more specified properties, and is fit for its intended use in the development of measurement and test methods that target those properties.

Note 2 to entry: A candidate reference material may be an RM for other properties, and a candidate reference material for the target property.

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