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## ISO GUIDE 35:1989 Certification of reference materials - General and statistical principles

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Abbreviation  
ISO GUIDE 35:1989  
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### Description

This guide discusses how reference materials (RMs) may be used in diverse measurement roles connected with instrument calibration, method assessment and assignment of property values.

### Scope

According to the definition given in 2.1, reference materials (RMs) may be used in diverse measurement roles connected with instrument calibration, method assessment and assignment of property values. The purpose of clause 3 is to discuss these measurement roles and to show how traceability of measurement may be secured by use of RMs, thus yielding worldwide compatibility of measurement.

Just as certified reference materials (CRMs) are to be preferred over other classes of RMs in citations in International Standards, so also are CRMs to be preferred over other classes of RMs in measurement science generally, given that CRMs needed for a particular type of measurement exist. Assistance in locating the source(s) of supply of CRMs for various technical fields is afforded by ISOs Directory of certified reference materials.

It will be evident that the quality of a measurement based on use of a CRM will depend in part on the effort and care expended by the certifying body on determining the property value of the candidate CRM. Hence the process of certification should be carried out using well-characterized measurement methods that have high accuracy as well as precision and provide property values traceable to fundamental units of measurement. Furthermore, the methods should yield values with uncertainties that are appropriate to the expected end-use of the CRM. Clauses 4 and 5 deal with two of the most important technical considerations in the certification of RMs - measurement uncertainties and material homogeneity.

Clause 6 provides general principles for RM certification.

Two commonly used general approaches to assuring technically valid RM certification are discussed in clauses 7 and 8.

Clause 7 describes the use of a single method of the highest accuracy (i.e. sometimes referred to as a definitive or absolute method) and usually employed by a single laboratory for RM certification. Clause 8 describes the use of an interlaboratory testing approach to RM certification, which might involve more than one method.

The metrological approach discussed in clause 9 has as its objective the production of certified values the accuracy and uncertainty of which are demonstrated by experimental evidence.

In summary, the purpose of this Guide is to assist in understanding valid methods for the certification of RMs and also to help potential users to better define their technical requirements. The Guide should be useful in establishing the full potential of CRMs as aids to assuring the accuracy and interlaboratory compatibility of measurements on a national or international scale.

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