

Recommendations for

Documentation of the preparation of certified reference materials for metallurgical analysis of non-ferrous metals

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Committees responsible for this British Standard

This British Standard was prepared by the Non-Ferrous Metals Standards Committee (NFM/-) upon which the following bodies were represented;

- Aluminium Federation
- British Lead Manufacturers' Association
- British Non-Ferrous Metals Federation
- Copper Development Association
- Institute of British Foundrymen
- Institution of Mechanical Engineers
- Institution of Structural Engineers
- International Tin Research Institute
- Lead Development Association
- Light Metal Founders' Association
- London Metal Exchange
- Ministry of Defence
- Non-Ferrous Metal Stockists
- Society of Motor Manufacturers and Traders Ltd.
- Zinc Development Association

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Foreword

This British Standard has been prepared under the direction of the Non-Ferrous Metals Standards Committee.

Certified reference samples of non-ferrous metals and alloys are available for comparative metallurgical analyses, in which instrumental methods, such as atomic emission or X-ray fluorescence spectrometry are used, and to assess chemical methods of analysis. The wider adoption of quality systems and a related industrial demand for closer analytical control make necessary more explicit documentation of the technical procedures used by bodies certifying reference materials.

Following discussions within the industry it was established that documentation of the preparation of certified reference materials for metallurgical analysis was specifically required by the non-ferrous metals industry. The initial drafting work was undertaken by the BNF Metals Technology Centre.

This British Standard is concerned with the method of documentation of the procedures followed in the preparation of non-ferrous metallurgical certified reference materials.

Its purposes are to recommend:

- a) the records to be kept, by the body that certified the reference material, concerning the preparation and verification of the material; to assist the producer of the certified reference material to participate in national certification schemes;
- b) the information to be made available to the user of the certified reference material; to assist the user of the certified reference material to participate in quality systems which require the calibration of physico-chemical methods of analysis to be based on well-authenticated certified reference materials, preferably traceable to national or international measurement and material standards, or to assess the accuracy of chemical methods.

In drafting this British Standard the contents of ISO Guides 30, 31 and 35 have been taken into account.

Assessed capability. Users of this British Standard are advised to consider the desirability of assessment and registration of a supplier's quality systems against the appropriate Part of BS 5750 by a third party certification body.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard recommends the documents to be kept by bodies certifying non-ferrous metal reference materials intended for use in the calibration of physico-chemical methods of analysis, or to assess chemical methods of analysis; and includes the information that needs to be made available to the user of such certified reference materials.

It covers materials in the form of solid blocks, discs, rods, pins, and in finely divided form including powders.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this British Standard the following definitions apply.

2.1 Terms related to materials

2.1.1

reference material (RM)

a material or substance of which the chemical content(s), homogeneity and stability are sufficiently well established to be used for the calibration of an analytical instrument, or the assessment of a chemical method, or for assigning values to the chemical contents of materials

2.1.2

certified reference material (CRM)

a reference material whose chemical content(s), homogeneity and stability are certified by a technically valid procedure, accompanied by or traceable to a certificate or other documentation which is issued by a certifying body (see 2.4.4)

NOTE A CRM may consist of units which are each certified individually or which are certified by examination of representative samples from a batch.

2.1.3

homogeneity

the condition of being of uniform metallurgical condition and chemical content(s). A reference material is said to be homogeneous if with regard to its intended use the metallurgical condition and the chemical content(s), as determined by tests on samples of stated size, are found to be within the certified uncertainty limits

2.1.4

sample

a representative quantity of material extracted from a batch of reference material

NOTE 1 The method of extracting the sample should ensure that it is representative of the batch with respect to metallurgical condition and chemical content(s).

NOTE 2 The term may be used to cover either a unit of supply or a portion for analysis.

2.1.5

batch

a definite quantity of material prepared under conditions which are presumed uniform

2.2 Terms related to chemical content and testing

2.2.1

certified value

for a certified reference material, the chemical content that appears on the certificate and other documentation relating to the material, this value having been certified by a technically valid procedure

2.2.2

uncertified value

a chemical content as stated by the producer of the material, but which is not certified by the producer or by any other agency

2.2.3

consensus value

a chemical content obtained by interlaboratory testing or by agreement between appropriate bodies or experts

NOTE A consensus value could, through appropriate action by a certifying body (see 2.4.4), become a certified value.

2.2.4

uncertainty

an expression of the range of values within which the "true" chemical content is estimated to be within a stated probability

2.2.5

best estimate

an estimate of a chemical content that is optimized by taking into account analytical and technical judgement, and statistical factors

2.2.6

interlaboratory test

a series of determinations of chemical content(s) performed independently by a number of laboratories on samples of a given material

2.2.7

traceability

the property of a measurement result whereby it can be related to appropriate measurement and material standards, generally international or national standards, through an unbroken chain of comparisons