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BSI Standards Publication

Analysis of steels and irons — Internal laboratory procedure for checking the accuracy of an analytical method by using Certified Reference Materials

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National foreword

This Published Document is the UK implementation of CEN/TR 10350:2013. It supersedes PD CEN/TR 10350:2009 which is withdrawn.

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A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Analysis of steels and irons - Internal laboratory procedure for checking the accuracy of an analytical method by using Certified Reference Materials

Analyse des aciers et des fontes - Procédure de contrôle intralaboratoire de l'exactitude d'une méthode analytique au moyen de Matériaux de Référence Certifiés

Analyse von Stahl und Eisen - Laboratoriumsinternes Verfahren zur Überprüfung der Richtigkeit eines Analysenverfahrens mit Hilfe zertifizierter Referenzmaterialien

This Technical Report was approved by CEN on 16 July 2012. It has been drawn up by the Technical Committee ECISS/TC 102.

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Foreword

This document (CEN/TR 10350:2013) has been prepared by Technical Committee ECISS/TC 102 “Methods of chemical analysis for iron and steel”, the secretariat of which is held by SIS.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes CEN/TR 10350:2009.

In comparison with the previous version of CEN/TR 10350, the following significant technical changes were made:

— Definition 3.12: Correction of the definition for “uncertainty of the certified values”;

— Table C.7: Correction of the confidence level for χ^2;

— C.2.3.3: Correction of the sample label: G instead of A.

Introduction

This Technical Report defines a procedure for checking, in each specific laboratory, the accuracy of an analytical method by the application of statistical principles to the analytical results obtained on Certified Reference Materials (CRMs).

This Technical Report is an adaptation of ISO Guide 33:2000 mostly for the specific cases where EURONORM-CRMs are used for checking, in an intralaboratory context, the accuracy of an analytical method.

Nevertheless, it may be adopted in any other case where CRMs selected have similar quality levels to those of EURONORM-CRMs.

1 Scope

The present statistical procedure describes how to check results for absence of bias by comparison of these analytical results with those obtained during the certification of CRMs.

If the resulting data confirm the absence of bias, the method may be considered accurate when applied to all steels and irons whose composition ranges are adequately covered or bounded by the CRMs used.

The resulting data give also an estimate of the repeatability and/or the intermediate precision ("intralaboratory reproducibility") for the CRMs used. The comparison of these analytical data with the repeatability data obtained during the certification may also be performed depending on the strict purpose of the method under consideration.

For the purpose of this Technical Report, the use of existing CRMs is essential for the assessment of the trueness, but it may be only indicative for the other statistical data.

NOTE This Technical Report does not describe the use of CRMs as calibrants, this subject being treated in ISO Guide 32.

2 Principle

This Technical Report describes a procedure for checking an analytical method used in a specific laboratory by using data obtained from the analysis of CRMs.

The absence of bias ascertained with CRMs can be extended to the trueness of further analytical samples adequately covered or bounded by the selected CRMs. Nevertheless it should be underlined that this Technical Report is not appropriate for the assessment of the repeatability and/or the intermediate precision data of the further analytical samples to be tested by the analytical method under consideration.

Checking the trueness of an analytical method as applied by a specific laboratory involves the comparison of the mean value of the analytical results obtained using CRMs with the certified value of each CRM selected. The standard deviation of the intralaboratory means of the selected CRMs is taken into account when making this comparison. Moreover, adjustment values chosen in advance by the laboratory, according to economic or technical limitations or stipulations are also taken into account.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
certified reference material
CRM
reference material characterized by a metrologically valid procedure for one or more specified properties, accompanied by a certificate that provides the value of the specified property, its associated uncertainty, and a statement of metrological traceability

NOTE 1 The concept of value includes qualitative attributes such as identity or sequence. Uncertainties for such attributes may be expressed as probabilities.

NOTE 2 Metrologically valid procedures for the production and certification of reference materials are given in, among others, ISO Guides 34 and 35.

NOTE 3 ISO Guide 31 gives guidance on the contents of certificates.

NOTE 4 VIM has an analogous definition (ISO/IEC Guide 99:2007, 5.14).