PD CEN/TR 10377:2023

BSI Standards Publication

Guidelines for the preparation of standard routine methods with wavelength dispersive X-ray fluorescence spectrometry

bsi.

National foreword

This Published Document is the UK implementation of CEN/TR 10377:2023.

The UK participation in its preparation was entrusted to Technical Committee ISE/102, Methods of Chemical Analysis for Iron and Steel.

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

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

This publication is not to be regarded as a British Standard.

Published by BSI Standards Limited 2023

ISBN 978 0 539 25645 1

ICS 77.040.30

Compliance with a Published Document cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 June 2023.

Amendments/corrigenda issued since publication

Date	Text affected

TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER REPORT

CEN/TR 10377

June 2023

ICS 77.040.30

Supersedes CR 10299:1998

English Version

Guidelines for the preparation of standard routine methods with wavelength-dispersive X-ray fluorescence spectrometry

This Technical Report was approved by CEN on 12 June 2023. It has been drawn up by the Technical Committee CEN/TC 459/SC 2.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. CEN/TR 10377:2023 E

Contents

Page

European foreword

This document (CEN/TR 10377:2023) has been prepared by Technical Committee CEN/TC 459/SC 2 “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 shall not be held responsible for identifying any or all such patent rights.

This document supersedes CR 10299:1999.

In comparison with the previous edition, the following modifications have been made:

— Conversion of the document from a CEN Report (CR) to a Technical Report (TR);

— Title: reworded;

— Clause 1, “Purpose of the guideline” split in “Introduction” and “Scope”;

— Definition 3.3, deleted;

— Definition 3.4, deleted;

— Definition 3.9, updated;

— Definition 3.10, updated;

— Definition 3.11, updated;

— Definition 3.12, updated;

— Renumbering of Clauses 2, 4, 5, 6, 7, 8, 9 and 10;

— Annex A updated and became “Bibliography”;

— Annex B, became Annex A;

— Annex C, became Annex B;

— Annex D, became Annex C;

— Annex E, withdrawn.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

Introduction

X-ray Fluorescence Spectrometry (XRF) has been used for several decades as an important analytical tool for routine analysis. XRF is characterized by its speed and high precision over wide content ranges. Since the technique in most cases is used as a relative method, its limitations are often connected to the quality of the calibration samples.

The technique is well established and most of its physical properties are well known.

1 Scope

This document is intended to be used for the analysis of metals and alloys (namely steels), but it can also be applicable to other materials although the sample preparation techniques differ. The purpose of this document is to describe general concepts and the procedures for calibration and analysis by XRF.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
calibration
calculation of the best fit of net intensities and contents from a number of calibration samples to a calibration curve

3.2
recalibration
calculation of new calibration constants with a few number of samples, selected from the calibration samples

Note 1 to entry: Calibration samples using the apparent contents calculated in 3.1

Note 2 to entry: To compensate for the day-to-day variations of the instrument a set of recalibration samples is measured; either one with a low and one with a high content for each element (two-point recalibration) or one with a high content only for each element (one-point recalibration). The intensities are compared to the initial intensities recorded during the calibration procedure and recalibration coefficients are calculated. Calibration constants are not changed.

3.3
background equivalent concentration
BEC
quantity of analyte which, when subjected to excitation, provides a net intensity equal to the spectral background

3.4
limit of detection
LOD
minimum content at which the signal generated by a given element can be positively recognised above any background signals with a specified degree of certainty