



NSAI
Standards

Irish Standard
I.S. EN 15063-1:2014

Copper and copper alloys - Determination of main constituents and impurities by wavelength dispersive X-ray fluorescence spectrometry (XRF) - Part 1: Guidelines to the routine method

I.S. EN 15063-1:2014

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:

EN 15063-1:2014

Published:

2014-12-17

This document was published under the authority of the NSAI and comes into effect on:

2015-01-19

ICS number:

77.040.20

77.120.30

NOTE: If blank see CEN/CENELEC cover page

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD

EN 15063-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2014

ICS 77.040.20; 77.120.30

Supersedes EN 15063-1:2006

English Version

Copper and copper alloys - Determination of main constituents and impurities by wavelength dispersive X-ray fluorescence spectrometry (XRF) - Part 1: Guidelines to the routine method

Cuivre et alliages de cuivre - Détermination des éléments principaux et des impuretés par spectrométrie de fluorescence X à dispersion de longueur d'onde (FRX) - Partie 1 : Lignes directrices pour la méthode de routine

Kupfer und Kupferlegierungen - Bestimmung von Hauptbestandteilen und Verunreinigungen durch wellenlängendispersive Röntgenfluoreszenzanalyse (RFA) - Teil 1: Leitfaden für das Routineverfahren

This European Standard was approved by CEN on 8 November 2014.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
Foreword.....	3
Introduction.....	4
1 Scope.....	5
2 Principle.....	5
3 Terms and definitions.....	5
4 Instrumentation.....	7
4.1 Principles of X-ray fluorescence spectrometers.....	7
4.2 X-ray tubes.....	8
4.3 Vacuum system.....	9
4.4 Test sample spinner.....	9
4.5 Filters.....	9
4.6 Collimators of slits.....	10
4.7 Analysing crystals.....	10
4.8 Counters.....	11
4.9 Simultaneous and sequential Instruments.....	12
5 Sampling and test sample preparation.....	12
6 Evaluation methods.....	12
6.1 General.....	12
6.2 Dead time correction.....	12
6.3 Background correction.....	13
6.4 Line interference correction models.....	13
6.5 Inter-element effects correction models.....	13
7 Calibration procedure.....	14
7.1 General.....	14
7.2 Optimizing of the diffraction angle (2θ).....	15
7.3 Selecting optimum conditions for detectors.....	15
7.4 Selecting optimum tube voltage and current.....	15
7.5 Selecting minimum measuring times.....	15
7.6 Selecting calibration samples.....	15
7.7 Selecting drift control and recalibration samples.....	16
7.8 Measuring the calibration samples.....	16
7.9 Regression calculations.....	16
8 Method validation (accuracy and precision).....	16
9 Performance criteria.....	17
9.1 General.....	17
9.2 Precision test.....	17
9.3 Performance monitoring.....	17
9.4 Maintenance.....	17
10 Radiation protection.....	18
Annex A (informative) Example of calculating background equivalent concentration, limit of detection, limit of quantification and lower limit of detection.....	19
Annex B (informative) Example of calculating line interference of one element to another.....	21
Annex C (informative) Example of performance criteria obtained under repeatability conditions.....	22
Bibliography.....	23

Foreword

This document (EN 15063-1:2014) has been prepared by Technical Committee CEN/TC 133 “Copper and copper alloys”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2015 and conflicting national standards shall be withdrawn at the latest by June 2015.

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 EN 15063-1:2006.

Within its programme of work, Technical Committee CEN/TC 133 requested CEN/TC 133/WG 10 “Methods of analysis” to revise the following standard:

EN 15063-1:2006, *Copper and copper alloys — Determination of main constituents and impurities by wavelength dispersive X-ray fluorescence spectrometry (XRF) — Part 1: Guidelines to the routine method*

This is one of two parts of the standard for the determination of main constituents and impurities in copper and copper alloys. The other part is:

EN 15063-2, *Copper and copper alloys — Determination of main constituents and impurities by wavelength dispersive X-ray fluorescence spectrometry (XRF) — Part 2: Routine method*

In comparison with EN 15063-1:2006, the following changes have been made:

- a) Definition 3.1 and 3.2 modified;
- b) Clause 5 modified;
- c) Editorial modifications have been made.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 15063-1:2014 (E)

Introduction

Wavelength dispersive X-ray fluorescence spectrometry (XRF) has been used for several decades as an important analytical tool for production analysis. XRF is characterised by its speed and high precision over a wide concentration range and as the XRF-method in most cases is used as a relative method, the limitations are often connected to the quality of the calibration samples. The technique is well established and most of the physical fundamentals are well known.

This guideline is intended to be used for the analysis of copper and copper alloys but it may also be applied to other materials.

1 Scope

This European Standard provides guidance on the concepts and procedures for the calibration and analysis of copper and copper alloys by wavelength dispersive X-ray fluorescence spectrometry.

2 Principle

An appropriately prepared test sample is irradiated by an X-ray beam of high energy. The secondary X-rays produced are dispersed by means of crystals and the intensities are measured by detectors at selected characteristic wavelengths. Concentrations of elements are determined by relating the measured intensities of test samples to calibration curves prepared from reference materials.

3 Terms and definitions

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

3.1

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

[SOURCE: ISO GUIDE 30:1992/Amd.1:2008, definition 2.1]

3.2

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

[SOURCE: ISO GUIDE 30:1992/Amd.1:2008, definition 2.2]

3.3

test sample

representative quantity of material for testing purposes

3.4

calibration samples

series of certified reference materials or if not available, reference materials used for calibration

3.5

drift control samples

series of homogeneous materials that contain all the elements which have been calibrated and that cover the low, mid and high points of the calibration range for each element, used to detect variations over time in these points

Note 1 to entry: Drift control samples can also be used for statistical process control (SPC) of the instrument.

3.6

recalibration samples

samples at both low and high points in the calibration ranges used to recalibrate the spectrometer

Note 1 to entry: These samples are measured during the calibration procedure and the intensities obtained are stored in the computer according to the manufacturer's instructions.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
 - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-