# Copper and copper alloys - Determination of cadmium content - Flame atomic absorption spectrometric method (FAAS)

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 15616

November 2012

ICS 77.120.30

Supersedes CEN/TS 15616:2009

English Version

# Copper and copper alloys - Determination of cadmium content - Flame atomic absorption spectrometric method (FAAS)

Cuivre et alliages de cuivre - Détermination du cadmium - Méthode par spectrométrie d'absorption atomique dans la flamme (SAAF)

Kupfer und Kupferlegierungen - Bestimmung des Cadmiumgehaltes - Flammenatomabsorptionsspektrometrisches Verfahren (FAAS)

This European Standard was approved by CEN on 20 October 2012.

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# Contents

Page

**Foreword** ..... 3
**1 Scope** ..... 4
**2 Normative references** ..... 4
**3 Principle** ..... 4
**4 Reagents** ..... 4
**5 Apparatus** ..... 5
**6 Sampling** ..... 5
**7 Procedure** ..... 5
**8 Expression of results** ..... 8
**9 Precision** ..... 10
**10 Test report** ..... 11
**Bibliography** ..... 12

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# Foreword

This document (EN 15616:2012) 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of an identical text or by endorsement, at the latest by May 2013, and conflicting national standards shall be withdrawn at the latest by May 2013.

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/TS 15616:2009.

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

CEN/TS 15616:2009, *Copper and copper alloys — Determination of cadmium content — Flame atomic absorption spectrometric method (FAAS)*

In comparison with CEN/TS 15616:2009, the following significant technical changes were made:

a) Conversion into a European Standard;

b) Scope (Clause 1) revised;

c) Principle (Clause 3) completely revised, dissolution process changed;

d) Precision (Clause 9) completely revised and the results of the precision test included.

According to the CEN/CENELEC Internal Regulations, the national standards organisations 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.

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# 1 Scope

This European Standard specifies a flame atomic absorption spectrometric method (FAAS) for the determination of the cadmium content of copper and copper alloys in the form of unwrought, wrought and cast products.

The method is applicable to products having cadmium mass fractions between 0,000 5 % and 0,1 %.

# 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1811-1, *Copper and copper alloys — Selection and preparation of samples for chemical analysis — Part 1: Sampling of cast unwrought products*

ISO 1811-2, *Copper and copper alloys — Selection and preparation of samples for chemical analysis — Part 2: Sampling of wrought products and castings*

# 3 Principle

Dissolution of a test portion in hydrochloric acid and nitric acid solution followed, after suitable dilution, by aspiration of the test solution into an air/acetylene flame of an atomic absorption spectrometer. Measurement of the absorption of the 228,8 nm line emitted by a cadmium hollow-cathode lamp.

# 4 Reagents

During the analysis use only reagents of recognised analytical grade and only distilled water or water of equivalent purity.

## 4.1 Hydrochloric acid, HCl ($\rho$ = 1,19 g/ml)

## 4.2 Nitric acid, $HNO_3$ ($\rho$ = 1,40 g/ml)

## 4.3 Nitric acid solution, 1 + 1

Add 500 ml of nitric acid (4.2) to 500 ml of water.

## 4.4 Cadmium stock solution, 1,0 g/l Cd

Weigh (1 ± 0,001) g of cadmium (Cd ≥ 99,8 %) and transfer it into a 250 ml beaker. Add 10 ml of nitric acid (4.2). Cover with a watch glass and, if necessary, heat gently to assist dissolution. When dissolution is complete, allow to cool and transfer the solution quantitatively into a 1 000 ml one-mark volumetric flask, dilute to the mark with water and mix.

1 ml of this solution contains 1,0 mg of Cd.

## 4.5 Cadmium standard solution, 0,005 g/l Cd

Transfer 2,5 ml of cadmium stock solution (4.4) into a 500 ml one-mark volumetric flask. Dilute to the mark with water and mix.

Prepare this solution immediately prior to use.

1 ml of this solution contains 0,005 mg of Cd.

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