National Standards Authority of Ireland

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ICS 77.120.30

COPPER AND COPPER ALLOYS - DETERMINATION OF NICKEL CONTENT - PART 3: FLAME ATOMIC ABSORPTION SPECTROMETRY METHOD (FAAS)

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English Version

Copper and copper alloys - Determination of nickel content - Part 3: Flame atomic absorption spectrometry method (FAAS)

Cuivre et alliages de cuivre - Dosage du nickel - Partie 3: Méthode par spectrométrie d'absorption atomique dans la flamme (SAAF)

Kupfer und Kupferlegierungen - Bestimmung des Nickelgehaltes - Teil 3: Flammenatomabsorptionsspektrometrisches Verfahren (FAAS)

This Technical Specification (CEN/TS) was approved by CEN on 12 September 2006 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

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Foreword

This document (CEN/TS 15023-3:2006) has been prepared by Technical Committee CEN/TC 133 “Copper and copper alloys”, the secretariat of which is held by DIN.

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

CEN/TS 15023-3, *Copper and copper alloys — Determination of nickel content — Part 3: Flame atomic absorption spectrometry method (FAAS)*

This is one of three parts of the standard/technical specification for the determination of nickel content in copper and copper alloys. The other parts are:

prEN 15023-1, *Copper and copper alloys — Determination of nickel content — Part 1: Spectrometric method*

prEN 15023-2, *Copper and copper alloys — Determination of nickel content — Part 2: Titrimetric method*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

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

The method is applicable to products having a nickel mass fractions between 0,001 % and 6,0 %.

2 Normative references

The following referenced documents are indispensable for the application of this European Technical Specification. 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 and nitric acid solution followed, after suitable dilution and the addition of lanthanum chloride to mask the effect of interfering ions, by aspiration into an air/acetylene flame of an atomic absorption spectrometer. Measurement of the absorption of the 232,0 nm or the 352,4 nm line emitted by a nickel hollow-cathode lamp.

4 Reagents and materials

4.1 General

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

4.2 **Hydrochloric acid,** HCl (ρ = 1,19 g/ml)

4.3 **Nitric acid,** HNO_3 (ρ = 1,40 g/ml)

4.4 **Nitric acid solution,** 1 + 1

Dilute 500 ml of nitric acid (4.3) in 500 ml of water.

4.5 **Lanthanum (III) chloride solution**, 100 g/l

Dissolve 100 g of lanthanum (III) chloride ($LaCl_3 \cdot 7H_2O$) in a 600 ml beaker with water and transfer the solution into a 1 000 ml one-mark volumetric flask. Dilute to the mark with water and mix.