Irish Standard
I.S. EN 15703-2:2014

Copper and copper alloys - Determination of manganese content - Part 2: Flame atomic absorption spectrometric method (FAAS)

I.S. EN 15703-2:2014

Incorporating amendments/corrigenda/National Annexes issued since publication:

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Copper and copper alloys - Determination of manganese content - Part 2: Flame atomic absorption spectrometric method (FAAS)

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Kupfer und Kupferlegierungen - Bestimmung des Mangangehaltes - Teil 2: Flammenatomabsorptionsspektrometrisches Verfahren (FAAS)

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

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Foreword

This document (EN 15703-2:2014) 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of an identical text or by endorsement, at the latest by June 2015 and conflicting national standards shall be withdrawn at the latest by June 2015.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.

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

EN 15703-2, *Copper and copper alloys — Determination of manganese content — Part 2: Flame atomic absorption spectrometric method (FAAS)*

This is one of two Parts of the standard/Technical Specification for the determination of manganese content in copper and copper alloys. The other Part is:

CEN/TS 15703-1, *Copper and copper alloys — Determination of manganese content — Part 1: Spectrophotometric method*

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.

1 Scope

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

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

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 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 279,5 nm or 403,1 nm line emitted by a manganese hollow-cathode lamp.

4 Reagents

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

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

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

4.3 Hydrofluoric acid, HF (ρ = 1,13 g/ml)

WARNING — Hydrofluoric acid is extremely irritating and corrosive to skin and mucous membranes producing severe skin burns which are slow to heal. In the case of contact with skin, wash well with water, apply a topical gel containing 2,5 % (mass fraction) calcium gluconate, and seek immediate medical treatment.

4.4 Nitric acid solution, 1 + 1

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

4.6 Sulphuric acid, H_2SO_4 (ρ = 1,84 g/ml)