

Copper and copper alloys - Determination of copper content - Part 2: Electrolytic determination of copper in materials with copper content higher than 99,80 %

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NATIONAL FOREWORD

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English Version

Copper and copper alloys - Determination of copper content -
Part 2: Electrolytic determination of copper in materials with
copper content higher than 99,80 %

Cuivre et alliages de cuivre - Détermination de la teneur en
cuivre - Partie 2 : Détermination par électrogravimétrie du
cuivre dans les matériaux ayant une teneur en cuivre
supérieure à 99,80 %

Kupfer und Kupferlegierungen - Bestimmung des
Kupfergehaltes - Teil 2: Elektrolytische Bestimmung von
Kupfer in Werkstoffen mit einem Kupfergehalt größer als
99,80 %

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

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Foreword

This document (EN 16117-2:2012) 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of an identical text or by endorsement, at the latest by May 2013, and conflicting national standards shall be withdrawn at the latest by May 2013.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.

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 16117-2, *Copper and copper alloys — Determination of copper content — Part 2: Electrolytic determination of copper in materials with copper content higher than 99,80 %*.

This is one of two parts of the standard for the determination of the copper content of copper and copper alloys. The other part is:

EN 16117-1, *Copper and copper alloys — Determination of copper content — Part 1: Electrolytic determination of copper in materials with copper content less than 99,85 %*.

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.

1 Scope

This European Standard specifies an electrolytic method for the determination of the copper content of unalloyed copper materials with a copper content higher than 99,80 % (mass fraction) in the form of castings, wrought and unwrought products.

Silver, if present, is co-deposited and is reported as copper. Approximately one-half of any selenium and tellurium present will co-deposit. Bismuth, if present, also interferes.

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 a nitric and sulphuric acid mixture. Electrolytic deposition of the copper on a platinum cathode of known weight with subsequent weighing of the cathode together with the electrodeposited copper. Determination of residual copper in the spent electrolyte by atomic absorption spectrometry.

4 Reagents

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

4.1 Sulphuric acid, H_2SO_4 ($\rho = 1,84$ g/ml)

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

4.3 Sulphuric acid-nitric acid mixture

While stirring, slowly add 300 ml of sulphuric acid (4.1) to 750 ml of water. Cool to ambient temperature. While stirring, cautiously add 210 ml of nitric acid (4.2).

4.4 Sulphamic acid, $H(NH_2)SO_3$

4.5 Sulphamic acid solution, 100 g/l $H(NH_2)SO_3$

Dissolve 10 g of sulphamic acid (4.4) in water and dilute to 100 ml. Prepare freshly before using.

4.6 Alcohol

Ethanol: 95 % \pm 0,2 %, methanol: min. 99,9 %, other alcohols: higher than 99,9 %.