

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 16117-1:2011 sisaldab Euroopa standardi EN 16117-1:2011 ingliskeelset teksti.

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English Version

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

Cuivre et alliages de cuivre - Détermination de la teneur en
cuivre - Partie 1: Détermination par électrogravimétrie de la
teneur en cuivre dans les alliages ayant une teneur en
cuivre inférieure à 99,85 %

Kupfer und Kupferlegierungen - Bestimmung des
Kupfergehaltes - Teil 1: Elektrolytische Bestimmung von
Kupfer in Werkstoffen mit einem Kupfergehalt kleiner als
99,85 %

This European Standard was approved by CEN on 27 August 2011.

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Foreword

This document (EN 16117-1:2011) 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of an identical text or by endorsement, at the latest by April 2012, and conflicting national standards shall be withdrawn at the latest by April 2012.

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

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:

- prEN 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 %*.

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, 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 European Standard specifies an electrolytic method for the determination of the copper content in copper materials with a copper content less than 99,85 % (mass fraction) in the form of unwrought, wrought and cast products.

Silver, if present, is co-deposited and is reported as copper. Approximately one-half of any selenium and tellurium present will co-deposit. Arsenic, antimony, bismuth and tin, if present, also interfere.

2 Normative references

The following referenced documents are indispensable for the application of this document. 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 fluoroboric and nitric acid mixture. Electrolytic deposition of the copper on a platinum cathode of known weight. Determination of residual copper in the spent electrolyte by atomic absorption spectrometry.

4 Reagents

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

4.1 Boric acid, H_3BO_3 .

4.2 Boric acid solution, 40 g/l H_3BO_3 .

Dissolve 40 g of boric acid (4.1) in a 1 000 ml one-mark flask with water, dilute to the mark with water and mix.

4.3 Hydrofluoric acid, HF ($\rho = 1,13$ g/ml).

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

4.5 Nitric acid solution, 1 + 1.

Add 500 ml of nitric acid (4.4) to 500 ml of water.

4.6 Ammonia solution, NH_4OH ($\rho \approx 0,91$ g/ml).

4.7 Hydrochloric acid, HCl, ($\rho = 1,19$ g/ml).

4.8 Alcohol.

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

4.9 Hydrogen Peroxide, H_2O_2 (30 % (mass fraction) solution, $\rho = 1,2$ g/ml).