



SLOVENSKI STANDARD
SIST EN 1978:2022

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Nadomešča:
SIST EN 1978:1999

Baker in bakrove zlitine - Bakrove katode

Copper and copper alloys - Copper cathodes

Kupfer und Kupferlegierungen - Kupfer-Kathoden

Cuivre et alliages de cuivre - Cathodes en cuivre

Ta slovenski standard je istoveten z: EN 1978:2022

ICS:

77.150.30 Bakreni izdelki Copper products

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Copper and copper alloys - Copper cathodes

Cuivre et alliages de cuivre - Cathodes en cuivre

Kupfer und Kupferlegierungen - Kupfer-Kathoden

This European Standard was approved by CEN on 15 August 2022.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword.....	3
Introduction	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions	5
4 Designations.....	6
4.1 Material.....	6
4.1.1 General.....	6
4.1.2 Symbol.....	6
4.1.3 Number	6
4.2 Product.....	6
5 Ordering information	7
6 Requirements.....	7
6.1 Composition	7
6.2 Electrical properties	7
6.3 Dimensions and tolerances	8
6.4 Surface condition	8
7 Sampling.....	10
8 Test methods	10
8.1 Analysis.....	10
8.1.1 Routine analysis	10
8.1.2 Analysis in cases of dispute	10
8.2 Electrical resistivity	11
8.2.1 Routine determination of electrical resistivity.....	11
8.2.2 Determination of electrical resistivity in cases of dispute.....	11
8.3 Retests.....	11
8.4 Rounding of results	11
9 Declaration of conformity and inspection documentation.....	11
9.1 Declaration of conformity	11
9.2 Inspection documentation.....	11
10 Marking.....	12
Annex A (normative) Methods for use in cases of dispute, for the sampling of cathodes and for the preparation of analysis samples	13
Annex B (informative) Information on electrical resistivity and conductivity relationships.....	16
Bibliography	17

European foreword

This document (EN 1978:2022) 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of an identical text or by endorsement, at the latest by March 2023, and conflicting national standards shall be withdrawn at the latest by March 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1978:1998.

In comparison with the previous edition, the following technical modifications have been made:

- a) The reference to EN 1655 has been replaced by EN ISO/IEC 17050-1 and EN ISO/IEC 17050-2.

This is one of a series of European Standards for products manufactured from refined copper grades. Other products are specified as follows:

- EN 1976, *Copper and copper alloys - Cast unwrought copper products*
- EN 1977, *Copper and copper alloys - Copper drawing stock (wire rod)*

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

EN 1978:2022 (E)**Introduction**

This document was prepared to combine the various requirements and methods of test for copper cathodes, previously dealt with in a range of separate national standards.

Copper cathodes are intended for melting. Cu-CATH-1 (CR001A) is primarily intended for the production of high conductivity copper, such as for drawing stock. Cu-CATH-2 (CR002A) is intended for the production of other wrought products for electrical and general purposes.

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1 Scope

This document specifies the composition and property requirements for cathodes of two copper grades, designated Cu-CATH-1 (CR001A) and Cu-CATH-2 (CR002A).

Annex A (normative) describes methods for sampling cathodes for use in cases of dispute between the purchaser and the supplier. Annex B (informative) gives information on the relationships between electrical resistivity and conductivity of copper.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 60468, *Method of measurement of resistivity of metallic materials*

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 %*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

cathode

flat, unwrought product made by electrolytic deposition

3.2

lot

quantity of copper cathodes weighing over 25 t and up to and including 200 t, consisting of one consignment, or part of one consignment, produced by one refinery

3.3

bundle

total amount of a certain number of cathodes, typically 20 to 60, stacked together and secured, generally by steel bands

3.4

sample of cathodes

number of cathodes randomly selected from the lot, and considered in total to be representative of the lot

3.5

cathode sample

portion of one of the sampled cathodes (see 3.4) obtained by systematic cutting of vertical strips

EN 1978:2022 (E)

3.6

bulk sample

sample produced by melting and casting the cathode samples (see 3.5) obtained from all the sampled cathodes into a suitable mould (or moulds)

Note to entry 1: This is considered to be representative of the lot.

3.7

analysis sample

representative fractions of swarf taken from the swarf arising from drilling, milling or sawing the bulk sample castings (see 3.6)

4 Designations

4.1 Material

4.1.1 General

The material is designated either by symbol or number (see Table 1).

4.1.2 Symbol

The material symbol designation is based on the designation system given in ISO 1190-1.

4.1.3 Number

The material number designation is in accordance with the system given in EN 1412.

4.2 Product

The product designation provides a standardized pattern of designation from which a rapid and unequivocal description of a product is conveyed in communication. It provides mutual comprehension at the international level with regard to products which meet the requirements of the relevant European Standard.

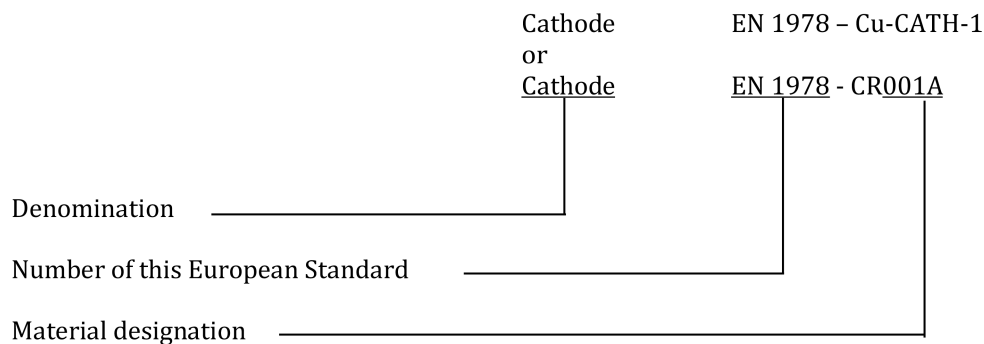
The product designation is not substitute for the full content of the standard.

The product designation for products to this document shall consist of:

- denomination (cathode);
- number of this document (EN 1978);
- material designation, either symbol or number (see Table 1).

The derivation of a product designation is shown in the following example.

EXAMPLE Cathode conforming to this document, in material designated either Cu-CATH-1 or CR001A, will be designated as follows.



5 Ordering information

In order to facilitate the enquiry, order and confirmation of order procedures between the purchaser and the supplier, the purchaser shall state on his enquiry and order the following information:

- quantity of product required (mass);
- denomination (cathode);
- number of this document (EN 1978);
- material designation (see Table 1).

It is recommended that the product designation, as described in 4.2 is used for items b) to d).

In addition, the purchaser shall also state on the enquiry and order any of the following, if required:

- the dimensions and tolerances required, if the cathodes are to be supplied cut to size (see 6.3);
- whether a declaration of conformity is required (see 9.1);
- whether an inspection document is required, and if so, which type (see 9.2).

EXAMPLE Ordering details for 100 t of cathode conforming to EN 1978, in material designated either Cu-CATH-1 or CR001A:

100 t Cathode EN 1978 – Cu-CATH-1

or

100 t Cathode EN 1978 – CR001A

6 Requirements

6.1 Composition

The composition shall conform to the requirements for the appropriate grade given in Table 1.

6.2 Electrical properties

The electrical properties shall conform to the requirements for the appropriate grade given in Table 2. The tests shall be carried out in accordance with 8.2.

NOTE Mass resistivity is the mandatory electrical property requirement in this document. The relationship between mass resistivity and the corresponding volume resistivity and conductivity is given in Annex B.

EN 1978:2022 (E)**6.3 Dimensions and tolerances**

The cathodes shall be either whole or cut to sizes as agreed between the purchaser and the supplier and stated in the purchaser's order [see Clause 5 e)].

6.4 Surface condition

Cathodes shall withstand ordinary handling without breakage. They shall be reasonably free from nodules, outgrowth edges and from all extraneous materials such as electrolyte residues, dirt, grease and oil.

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